Gleanings in Bee Culture

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GLEANINGS IN BEE CULTURE

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STRAY STRAWS
by Dr. C. C. MILLER

DR. E. F. PHILLIPS' government bulletin on queen-rearing now appears in French, by M. Mont-Jovet.

A. I. ROOT seems to be an enthusiastic preacher of the gospel of outdoor air. Keep it up, Bro. Root.

ITALIANS, says R. Pincot, *Apiculteur*, page 113, build cells having a mean diameter of 5.5 millimeters, while the natives reach only 5.2 millimeters.

THE *Irish Bee Journal*, one of the brightest in the world, opens its 7th volume in spick-and-span new dress, and its paper and typography are now in keeping with its contents.

THAT BEES automatically follow any one color when foraging is disproved by seeing a bee on a hyacinth-bed, visiting in succession all the different colors on one trip.—U. Kramer, *Schweiz. Bztg.*, p. 148. [Correct you are.—ED.]

I PROPHESY that the "Temperance" department will not be a permanent feature of GLEANINGS. "'Cause why?" Because at the rate things are now moving it will no be long till saloons are driven out entirely, and then there will be no need of the department.

BEES BUILD their cells not exact hexagons, but with the transverse diameter greater than the two oblique diameters. Following this, Rietsche makes foundation with cells having a transverse diameter of 5.6 millimeters (.220472 of an inch, or 4.5357 cells to the inch), and oblique diameters of 5.45 millimeters.—*Apiculteur*, p. 113.

L. E. MERCER is a dangerous man to be running around loose among bee-keepers, setting examples of extravagance. At the Los Angeles convention he was sporting an automobile. I forgave him that extravagance because he gave me a spin in it; but there he is again, top of p. 771, at work *with his Sunday clothes on!* For such extravagance there can be no forgiveness.

SPECULATIVE FEEDING is the name in Germany for what we call stimulative feeding, and an appropriate name it is. Lehrer Cremer says in *D. Bienen Zucht*, "He who speculates, always risks, and often loses." [Stimulative feeding in the hands of a beginner may be and probably is at times "speculative;" but in the hands of a veteran there need be no risk.—ED.]

OBSERVANT bee-keepers can hardly fail to have noted that, when brood-rearing is about to cease, eggs and sealed brood will be found, but no unsealed larvæ. Devauchelle (*Apiculteur*, 142) says this is because the temperature in the brood-nest sinks below 80°, hence too cold for the eggs to hatch, although the queen continues laying. He has found the same thing to occur in cold spells in the spring.

A BEE, when it travels afoot, always moves three legs at a time; but it isn't a pacer. The front leg and the hind leg on one side move simultaneously with the middle leg on the other side. [It is probable that not one bee-keeper in a thousand would be able to describe the movements of the legs of a bee in walking. Probably now a good many of us will watch the operation and see if the observation here made is correct.—ED.]

IN GERMANY a solution of honey in alcohol and water is generally used as a lubricant for foundation-machines. Cheaper and better, says Kramer (*Schweiz. Bztg.*, 156), is this: Grate raw unpeeled potatoes, and pour on them water quite warm. Stir a few minutes; strain, and you have the very best lubricant. Isn't that practically the same as starch, that has been largely used in this country? [Yes, but not quite so good. The trouble with a starchy lubricant is that it is likely to sour and mildew on the foundation after it is packed in boxes. We would object to alcohol and water, because the for-

mer is expensive, and besides we have no *proof* that soap *is* obnoxious to bees.—ED.]

DR. BRUENNICH, one of the best authorities on the other side of the water, quoting Doolittle as authority for letting bees do their own superseding, says in *Bienen Vater* that Doolittle is an investigator of bees for whom he has extraordinary respect, counting him one of the greatest lights among bee-keepers in the whole world. It seems good to find a man broad-minded enough to recognize worth in whatever country it may be found.

"SECTION" is a word likely to be overworked if sectional hives come into prominence. On page 766, Fig. 3 shows a "section filled with brood-frames," and Fig. 2 a section filled with sections. Isn't there too much "section" about that? Why not use "a *story* of brood-frames" and "a *story* of sections"? [We can not see how there could be any confusion, as the context will almost invariably show what is meant. We have many samples of the same thing in our common English of every-day life.—ED.]

APICULTURAL-EXPERIMENT stations number 33 in Austria; in Switzerland, 38; in U. S.—? [Our dear Uncle Sam is doing a great deal for us now; but, say—it is not true that he has no stations for the study of apiculture. Besides the one at Washington, D. C., there is a sub-station at Chico, California, in charge of J. M. Rankin. Already much and important work has been done, especially in the line of original investigation of bee diseases. A multiplicity of stations may not do the work of a couple of good ones.—ED.]

DR. BRUENNICH (*Leipz Bztg.*, p. 42) takes Americans severely to task for their unscientific methods in bee culture, running all over the world for new varieties, and mixing blood indiscriminately, instead of persisting in the pure culture of some one variety. The rebuke is merited, doctor; but please remember that conditions here are not the same as in Switzerland. You have found that the native bee is better for you than any foreign variety, and you are wise to persist in its pure culture. We have found that for us a foreign variety is better than the native, and as yet are not entirely sure that some other foreigner may not be still better. Do you blame us for scouring the world for that possibly better variety?

THE FEAR that bees would gnaw around foundation splints has prevented your enthusiasm, Mr. Editor, p. 755. Will that fear be removed if I tell you that my bees never gnaw around them? In the thousands of splints I have used I never saw one gnawed around—no, not the fraction of an inch. Your fears are not well founded when based upon experience with tin bars not coated with wax. A 32 wire may be the largest bare metal they will stand, but I'll agree to put in a coated wooden splint a full inch wide, and there shall be no gnawing. Please don't base your fears upon imagination. [We take it all back, doctor; but now can you get up some satisfactory machine or method for making the splints? Whenever we get an order from you for them our workmen have a regular time of it. They are exceedingly difficult to make; and if we were to charge what they are worth it is a question whether the public would buy them. Broom-splints of the right size have been substituted, but they are irregular.—ED.]

IF ANY PROOF is needed that the new local-option law in Illinois is a good one, here is that proof from a Chicago daily, it being a special from Peoria, Ill., dated May 14: "The liquor interests of the State have formed an organization to fight the local-option law in all its features. Distillers, brewers, and saloon-keepers from every part of the State have been implored to join the organization for their own protection." [The value of new temperance legislation can be gauged pretty accurately by the subsequent actions of the liquor interests. It is the "hit bird that flutters," you know. You will note that, every time any new important piece of temperance legislation is enacted, the brewers and their allied interests get busy.—ED.]

THE INTERESTING matter about wax-rendering in GLEANINGS, June 1, raises the question whether it will not be better to have wax-rendering a specialty in the hands of a few to whom others shall send old combs, etc., just as foundation-making is a specialty. [There are two objections to this. One is that the sending of combs indiscriminately over the country, especially those that are discarded because they were filthy or possibly diseased, will be likely to spread serious contagion. Second, combs are very bulky. The boxes would be large and unwieldy, and the freight would be high. We have in some cases solicited consignments of old combs; but there is so much dross and filth that we don't encourage the practice of sending them except for experimental purposes. The process of wax-rendering is not so difficult as it might seem. All there is to it is plenty of hot water and frequent squeezings of the slumgum, followed by thorough washing. But when it comes to reading over the mass of details of various writers one is liable to become confused.—ED.]

THE apiary shown on the front cover page of this issue is that of W. Z. Hutchinson, at Flint, Mich.

WE have been advised unofficially that the next convention of the National Bee-keepers' Association will be held at Harrisburg, Pa. We presume we shall hear from Mr. France direct. In the mean time we would state

that Harrisburg is in the heart of a fine bee country and big-hearted bee-keepers. They will, no doubt, see to it that the National is royally entertained.

Mr. Lea, the government entomologist of Tasmania, has been advising all the fruit-growers of that country to keep bees to insure the full fertilization of the fruit-blossoms. He has also warned the growers against spraying while the trees are in bloom.

Dr. B. H. Warren, the State Dairy and Food Commissioner of Pennsylvania, has declined to occupy again that position, his term of office having expired. He is the man who brought the glucose trust to its knees in the Keystone State, and, besides, has conducted a strenuous campaign in behalf of pure food when it was much needed.

DOES IT PAY TO FURNISH FREE ALSIKE SEED TO FARMERS?

Fortunate will be those who have had a lot of alsike-clover seed scattered around in their vicinity. In the neighborhood of our out-yards we are having a fine growth of the plant, and we expect a fair return in the form of nectar — if not this season, another year. Remember that we gave away the seed *free* to all parties who applied for it within a mile of our yards. One farmer would tell another about our free-seed proposition; and the result was that many came for the seed. But we expect to get it all back within two years, and a good profit besides. He who never casts his bread upon the waters will never have any in return.

SHOULD THE NATIONAL BEE-KEEPERS' ASSOCIATION EXHIBIT HONEY AT THE WORLD'S PURE-FOOD SHOW?

The editor of the *American Bee Journal* follows up our suggestion that the National Bee-keepers' Association be represented at the World's Pure-food Show at Chicago, Nov. 19 to 25, by adding another that some of the money from the Honey-producers' League be used for making a honey display. This show of pure foods is exciting world-wide interest and enthusiasm, hence the necessity for a honey-exhibit. If we do not fall into line the public may conclude our honey is bogus, and that we are afraid to show it. If the honey crop is short, that is only another reason for the exhibit, as the bee-keepers will require a better price for their product than they have been getting.

FOREST RESERVES.

The Secretary of Agriculture, as we expected, has determined to do something with the forest reserves, and now proposes to take measures to improve the pasturage available for stockmen where the land is suitable. A special officer, Mr. Colville, has been appointed to do what he can to improve pasturage conditions. We hope the Department of Agriculture will take care to see that the bee-keepers are given a fair chance as well as the cattle-men, by planting seeds which are not only good for stock but for bees as well. If the government can naturalize some of the various species of clover on these immense tracts the bee-keeping interests of the nation would be considerably benefited. No doubt Dr. Phillips will see to it that something of the kind is done.

THAT FIELD OF DANDELIONS ILLUSTRATED ON PAGE 840.

Probably some of our amateur photographer subscribers will be interested in knowing how this photo was secured. It is a well-known fact that yellow and green, to the ordinary dry plate, are almost one and the same thing, for the photo will make it appear that every thing is of one color; but by putting in what is known as the ray filter, with a yellow screen, we get fairly correct color values. In the photo reproduced elsewhere one will see the sharp contrast between blossoms and the green foliage; and this contrast is made possible by the use of the yellow screen.

We desire to suggest that, in photographing highly colored honey-plants, which a correspondent may desire to be seen in an engraving, before doing so he consult with us or some expert photographer as to how to secure the proper color values. In many cases orthochromatic plates will help greatly. At other times a ray filter will give satisfactory results, but a great many times it produces no effect except to delay the exposure.

SWEET CLOVER IN A NEW LIGHT.

In the *Australian* of April 6, which has just come to hand, sweet clover is made to appear in its true light. The paragraph is in answer to a correspondent.

> The missing specimen has come to hand, and has been identified by the Government Botanist as the *Melilotus alba*, the white flowering melilot, an introduced plant belonging to the *Leguminosæ*. The odor of the plant is due to cumarin, which in excess acts as an intoxicant, and also gives a strong flavor to milk and butter. In moderate amount, however (10 per cent or so), it adds to the flavor and palatability of the hay or herbage; but it would be highly inadvisable to allow stock to graze entirely or mainly on this plant. As in many other cases, a little is good and excess injurious.

The idea of adding 10 per cent of sweet clover to any other fodder to give it palatability is excellent—more especially so in the case of corn silage, which is lacking in taste and nutriment. If we could induce farmers to see the practicability of this idea, sweet clover would probably become a prominent farm crop. In other words, the fodder would be flavored with vanilla (cumarin). Quite possibly the objections to silage as a feed for milch cows would disappear if sweet clover were added to it in a proportion of 10 or 20 per cent. It is worth thinking about, and some experiments ought to be made at once; for sweet clover grows easily in the corn-producing States. Bee-keepers would do well to call attention to this suggestion in all agricultural papers.

THE RESULT OF MR. BENTON'S TRIP IN QUEST OF NEW RACES OF BEES IN THE EAST.

AFTER receiving an official announcement (published in our last issue) to the effect that Dr. E. F. Phillips, formerly acting in charge, was now Apicultural Investigator in the Bureau of Entomology, we wrote to the acting Chief of the Bureau, G. L. Marlatt, stating that we had as yet received no information as to the result of the trip of the former Apicultural Investigator, Mr. Frank Benton, in the East in search of new races of bees, adding that we had received numerous inquiries as to the outcome, and that any information that the Bureau could give us we should be pleased to place before our readers. The subjoined letter will explain:

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF ENTOMOLOGY.

WASHINGTON, D. C., May 29, 1907.

My dear Sir:—I am in receipt of your letter of May 16th, asking for information concerning the results of the trip by Mr. Frank Benton, in search of new races of bees.

I regret that I am unable to give you a report of this trip, since the Bureau of Entomology has received no such report from Mr. Benton, and he is no longer connected with the Bureau of Entomology. The only information which we have on the subject is a verbal statement from Mr. Benton to the effect that he found very few bees, and was unable to ship any of them to this country. The tone of his statement concerning them would indicate that they are not desirable.

Respectfully yours,

G. L. MARLATT,
Acting Chief of Bureau.

The A. I. Root Co.:
Mr. E. R. Root, Ed. GLEANINGS IN BEE CULTURE,
Medina, O.

We regret very much the outcome of the trip; for in view of this failure to produce results it will probably deter any further attempt on the part of our government to send a man after new races of bees for some time to come, and perhaps it is just as well. Any desirable race of bees capable of domestication can be sent here by some resident beekeeper at an atom of the expense it would take to send a man after them.

We were under the impression that *Apis dorsata* was the particular bee sought for in the Benton expedition; but his experience was doubtless the same as that of others—the difficulty of confining or housing these bees and shipping them. At one time there was great enthusiasm manifested in the matter of importing them to the United States; but in view of the several unsuccessful attempts to domesticate them, even in their own habitat, to say nothing of the difficulty of getting them here, we may conclude that they, like the bumble-bees, will always remain in a wild state, and in a climate adapted to their nature.

INVESTIGATIONS OF FOUL BROOD IN GERMANY.

DR. ALBERT MAASSEN, of the Kaiserlichen Anstalt, at Dahlem, Germany, has recently issued another brief statement on his investigations of brood diseases of bees which is of interest. In June, 1906, Dr. Maassen issued a note announcing that he had examined 112 cases of diseased brood, and had found *Bacillus alvei*, Cheyne, in but 13. Since, as we now know that *Bacillus alvei* is found in European foul brood, this would indicate that this disease is present in Germany, a supposition which is the more strengthened by symptoms mentioned in various foreign journals and texts.

In the other 99 cases *Bacillus alvei* was not found; and while the author does not give the symptoms of these cases, the descriptions of foul brood in foreign publications would indicate that the ropy type of disease, American foul brood, is the prevalent disease in Europe, and we are justified in the surmise that this is the disease in which *Bacillus alvei* was not found. *Bacillus alvei* is never found in American foul brood in this country, according to recent investigations of Dr. Moore, of Cornell University, and, later, of Dr. White, in the Department of Agriculture, Washington, D. C.

This is further strengthened by the fact that, while spores are present in abundance in diseased material, they grow only with difficulty. The author speaks of the presence of another bacillus; but in neither of his papers does he give us any description of the organism, so that it is impossible to tell what it is that he finds. The uniform presence of this other bacillus, and the prevalence of American foul brood in Europe, justifies us in thinking that the bacillus found in the 99 cases is possibly *Bacillus larvæ*, White.

All recent workers on the brood diseases of bees—Burri, Lambotte, and others, speak of the fact that the bacillus in ropy foul brood fails to grow, or grows only with difficulty, on the usual laboratory media, and this, to that extent, confirms the work of Dr. G. F. White, of the Bureau of Entomology.

Dr. Maassen has also seen two other organisms in diseased material, *Streptococcus apis* and *Spirochæte apis*. He has not as yet described these micro-organisms, nor has he established any casual relationship for any of the species seen by him in diseased material. The work is still being carried on.

BUCKWHEAT CAKES AND HONEY.

THE honey market is not the only one which has been improved by the passage of the recently enacted pure-food laws. The latest to come to our notice is buckwheat, which has recently taken a rise owing to the fact that buckwheat flour in future must be buckwheat flour, and not a mixture of "Red-dog flour" and buckwheat.

There were some who all along declared that a good deal of our buckwheat flour was not genuine, and it appears they were entirely right in their surmise. The result is, there is not enough of the genuine article to go round just now. In addition, it is said that the American people are more disposed than formerly to eat buckwheat cakes; but they want the real goods, and they ought to get them by all means. This looks like good news, and there is every indication that these statements are not in the least overdrawn.

This prompts several of our agricultural exchanges to urge their readers to grow

more buckwheat. For example, the *Wisconsin Agriculturist* gives its opinion that the demand for buckwheat has suddenly doubled, owing to the action of the pure-food laws, and advises its readers in favorable localities to engage in its culture, stating that there is much suitable land in that State. As there is quite a large contingent of bee-keepers in Wisconsin, we hope this advice will fall on willing minds. Some of the other States would probably succeed just as well, and it is reasonable to suppose that an interest in buckwheat can be created where at present none exists. If it should get to be as popular all over the country as it now is in the East, the bee-keeping interests of the country would be immensely benefited, for this grain not only yields honey, but calls for it after it has reached the table.

There is also a demand for buckwheat among poultry-keepers, since it was found the European poultry experts used a combination of buckwheat flour, oatmeal, and barley flour for fattening and finishing poultry for critical city markets. Evidently there is a bright future for buckwheat in this country at least, and probably in Canada as well.

IMPORTANCE OF BETTER HIVE-COVERS, AND PAPER-PROTECTED SUPERS.

MANY facts go to show that the ordinary single-thickness board cover, while costing something less than the double cover, is expensive to maintain. A hot sun will penetrate through it, requiring more bees to stay at home to ventilate to keep down the temperature of the hive; and during the fall and spring months it permits a great deal of valuable heat to radiate.

Mr. D. A. Jones, of Beeton, Ont. (a bee-keeper who, twenty years ago, had attained a world-wide fame in beedom as the one who, in connection with Mr. Frank Benton, went to the Orient and came back with new races of bees), called our attention one frosty morning in the fall, when we were visiting him, to a rather interesting phenomenon; but in doing so it was evidently not his purpose to show that a single-board cover was too thin, and hence a waster of heat, but, rather, to show how strong his colonies were, and how he gauged their strength by an examination of the top of the hive-covers. Said he:

"Ernest, come with me. I want to show you something."

As we went up and down the rows that early morning he drew our attention to the fact that the tops of the hive-covers were covered with a white frost except oval spots over the centers of the clusters.

"Now," said he, "just notice that these ovals vary in size. In the case of a very strong colony, the white frost is thawed almost clear out to the edges of the cover. In the case of a medium-strength colony the oval is smaller, and so on clear down to the nuclei. There," he said, "on a morning like this I can determine the strength of every colony."

If it then occurred to him that these ⅞-inch board covers were too thin, and were radiating very valuable heat, he did not mention the fact, nor did we think of it at the time; but during the twenty years since then we have often thought of it. We have seen a similar phenomenon at other yards; and the conclusion has been irresistible that such covers, while useful at times to indicate the strength of a colony, are wasteful of stores and brood. A colony not warmly protected is compelled to eat more in order to keep up the requisite animal heat.

But that is not all. Many hives of bees are put out in the open without shade-boards. While the bees will keep the interior of the hive cool they do so at an enormous waste of energy, keeping back a lot of fielders that ought to be gathering nectar.

Quite a number of the bee-keepers of the country are beginning to use double covers. R. F. Holtermann and Dr. C. C. Miller are both strong advocates of such covers. The former uses an extra piece of paper felting between the two covers. Dr. Miller uses only two thicknesses of ⅜ boards with a dead-air space between. While this is good, it does not go quite far enough. Should we have a cool summer, and especially if we should have cool nights, there will be a lot of backward work in the supers unless the bees are provided with a good thick cover.

Those bee-keepers who are fortunate enough to own a double cover, one telescoping over the other, should place between the two covers several folds of newspaper. Those who are still more fortunate in having a deep telescope cover would do well to interpose between the two some newspapers with the ends falling over the sides and ends; then shove a telescope cover snugly over the whole. This is not theory nor guesswork, because we have seen the proof of the pudding; and if any of our readers will test it themselves, select a dozen colonies of equal strength; give half of them single ⅞ boards for the covers, and the other half telescope covers with newspaper folds under them as explained.

But there will be some who will find themselves without these telescope covers. All such we would advise securing some large squares of heavy manilla paper. Fold the old newspapers over the top of the regular hive-cover; then, with the help of an attendant, fold one of the squares of manilla papers centrally over the top. Tuck the edges neatly down over the super as you would a package of soap, and then tie a string around it, looping it into a bow-knot.

"Oh! but," you say, "this will be a lot of work."

Admitted. But you will find it will pay you just the same, if our experience and observation are any criterion.

We suspect some will say, "If we have to fuss with a lot of strings and papers we will go out of the business."

To all such we can only say, "Try it and let us know the result."

Heavy manilla paper will stand severe

storms for at least one season; and while it may be considerable work to untie the strings and put them on again, you will probably conclude that a winter case made of solid wood will be a justifiable expense. The paper, of course, will be good for only one season.

PARAFFINE PALMED OFF AS CERESINE.

A CIRCULAR letter has been recently sent out by an Austrian firm calling attention to the deception being practiced by certain firms in this country who send or export to Germany paraffine wax which, by various means, is made to resemble ceresine wax. Apparently the bulk of the so-called ceresine imported is simply "doctored" or "doped" paraffine. They use small quantities of the genuine wax, together with aniline dyes to give the required color. To make it appear opaque they mold it at a low temperature.

If we are not misinformed this same "ceresine" is intended for human consumption in some cases, and hence comes under the scope of the United States pure-food laws. We may explain to our readers that ceresine is a superior mineral wax made from ozokerit, which is mined in Austria. If the United States Department of Agriculture and Internal Revenue officers of the Treasury act in this matter there ought to be no difficulty in stopping this dishonest trade.

This practice is largely followed to get away from buying beeswax, for some purposes at least.

Of course bee-keepers need have no fear in buying comb foundation, for nothing but pure beeswax is used by the manufacturers of this article. It has been intimated once or twice that adulterated foundation could be bought in this country; but so far as we know, there is absolutely none of it.

WEATHER CONDITIONS AND HONEY PROSPECTS UP TO JUNE 8.

WEATHER conditions have continued to be unfavorable, with a cool or chilly atmosphere, with much rain and occasional snows in the northern portions of the country. In Cleveland, Uhrichsville, and many other points in Northeastern Ohio, for example, light flurries of snow were reported on June 5th. This broke all records since 1882, and similar conditions were reported in some of the other Northern cities.

The clovers and basswood seem to be backward over the country generally, although in the extreme Eastern States some clover is already in bloom; but at last reports it was yielding no honey. The up-to-date bee-keepers who feed their bees will have powerful colonies for the harvest if it *does* come; for it has not been too cool to raise brood. But many bee-keepers will suffer this spring mainly through starvation (especially the don't-care kind), for bees have used stores enormously during the last month in brood-rearing; for they, like their owners, have been willing to draw on the last available supplies with the expectation that good weather must come, and with it a good supply of nectar.

We have received no favorable reports from any locality except Oregon and Washington, where a good crop of honey is expected. But this is true: Bees in the hands of progressive bee-keepers will be in fine condition; and should there be a late honey-flow, which is not at all improbable, if the past is any criterion, after a late wet season the bees will probably redeem themselves and their owners.

The irrigated regions, were it not for the cool atmosphere, would have their rain-belt competitors at a great disadvantage, and they may have yet.

We are by no means discouraged; for in 1882, a year similar to this, when bees died heavily during the spring, and bee-keepers had entirely given up all hopes, there was a good crop of honey, though it was late. The clovers, so far as reported, are in good condition; and should we have suitable weather later on we shall have a nice flow of nectar.

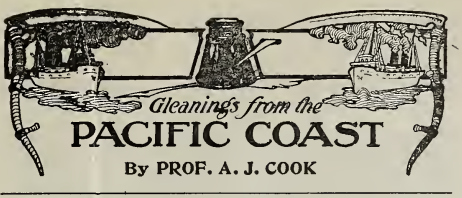
In the southern portions of the country, where the main honey-bearing flowers are out of bloom and past, there is not much in the way of encouragement; but we Northerners still have strong hopes. In the mean time let us not be discouraged. If we do get a crop the good prices we shall probably secure this year will more than make up for the discouraging conditions early in the season. This will, therefore, be a season of the survival of the fittest in the Northern States. All others will be frozen out, or, perhaps, more exactly, *chilled* and starved out.

THE SOUTH THE DUMPING-GROUND.

What to Eat for April contains a severe arraignment of most of the Southern States because they refuse to fall in line with the Northern and Western States in pure-food laws for the protection of the lives of their citizens.

The conditions are worse than formerly, because the concerns that formerly had a market in the North for adulterated goods are now obliged to dump the *whole* of their stuff into the Southern market or export it. This condition of affairs would not continue much longer if a few good people would resolutely set to work to have this matter settled right. It seems very extraordinary that the people of the South should be willing to have foisted on them all sorts of concoctions which are deleterious to health, and in some cases are actually deadly to persons eating them.

There are a large number of GLEANINGS readers in the South — enough to raise quite an interest in the subject if they would only set themselves to work in the right way, and get up a petition in their own neighborhood. This is the right time to strike, and strike hard. There is a great stigma in the thought that the North dumps its dangerous food products on to the South. Will it suffer this wrong?



THE SEASON.

California bee-keepers are suffering another disappointment in the failure so far, this season, of realizing their expectations of a fine bee-year. As this is the second in succession, it can not fail to make the less courageous lose heart, and question the reliability of the business. In the past it has been considered almost certain that we would get a good honey crop if there were good and timely rains. This was thought rightly to be a great advantage, as the bee-keeper would know of a surety in the early spring whether he would need supplies, as sections, etc., and so would buy or not according as the rainfall would be generous or scant. Both last year and this the rains have been very plentiful, and bee-keepers, according to all the experience of the past, had reason to expect very prosperous years. Our average rainfall at Los Angeles, for a long period of years, has been 15 inches. At Pomona, 4½ miles from here, it is 18 inches. This year we have had over 25 inches, and it came so gently and so well distributed through the season that we had every reason to look forward with very pleasing anticipation.

But last spring and this have suffered a climatic change that has dampened the hopes of the bee-men. We have very cool weather, so that the bees have been kept from the field much of the time, and, when there, seemed to get no nectar to speak of. We have fogs in the morning, which, though they make our days delightfully cool and pleasant, are not conducive to nectar secretion, and greatly hinder the work of the bees. Indeed, I hear of many that are having to feed the bees to keep the wolf from the entrance. We may hope that these cool seasons will not continue; they surely put a second (?) after the suitability of our region for bees and honey.

AN INTERESTING EXPERIMENT.

There is a German bee-keeper living between Claremont and the nearby mountains, by the name of Arms. He has quite an area of land which is so stony that it is good for little else than bee-forage. It abounds in sage and buckwheat, and, with favorable seasons, Mr. Arms realizes good money from his apiary. I suppose that every bee-keeper is the better if he has something of an inventive genius. Mr. Arms seems not destitute of this peculiarity. He saw that he secured good honey crops in seasons of good rainfall, and none when the rainfall was far below the normal. So he bethought to divert the water from San Antonio Creek, when it was running full, after heavy rains, and wasting its precious freightage in the not distant ocean. So he bethought of digging ditches and filling sink-holes and basins on his land, on which there are not a few. He found that the water sank rapidly into the gravel. This experiment not only benefited Mr. Arms, but all the community, as it was learned that all the winter runoff can be retained by dividing the stream and conducting the water on to the porous gravels, which have a wondrous and quenchless thirst for the life-giving water. It will be of great benefit if all this water can be easily and cheaply retained in the underground reservoirs, and not lost in the great sea. From the experience this winter, we believe that this will be possible; and very likely, through the accidental demonstration of this poor and unlettered bee-man, our section will reap a lasting benefit. It is probable, if we can fill up these reservoirs every season, as seems possible, we can secure water to make many more of our very fertile acres blossom like the rose.

POLLEN.

I have a large and very enthusiastic class in botany at the present time. It numbers 32, and for the past days they have been studying pollen. It is a very fascinating subject for study. They find that the pollen grains differ very much in form and markings. Indeed, we can almost always tell what flowers bees have visited by simply looking at the pollen grains. In some cases the form of the pollen is beautiful indeed. Nor is it alone in form that the pollen is attractive. The students find that the color is quite as attractive, and worthy of attention. They find that yellow is by far the most common color, but the yellow varies all the way from a very light yellow or straw color even to the darkest yellow, and from that to orange, often nearly red. Brown pollen comes next in order; and dark pollen, almost black at times, is not wanting. The opposite color, or white, is sometimes met with among the plants of the snap-dragon family (*Scrophulariaceæ*). This is the figwort family, and has many very famous honey-plants, as the figwort of Ohio and the East. They also find green and bright-blue pollen. These are rare, but are beautiful ornaments as they hug the pollen-baskets of the hind legs of the bees. The gilias are very common here, and very beautiful. Many of these have the blue pollen, and we often find the bee getting pollen and honey from the gilias at the same time. These flowers are scattered too much to be of the best service; but I feel sure that we get much benefit from them. I gave this subject to the pupils to investigate, and I asked them how they found out what they reported, and the answer was that they could see the color in the anthers of the flowers; that often they could shake the pollen on to white paper so as to determine the color; but best of all was to get the bees to help them. They find all the colors of pollen mentioned

above, on the legs of the bees, snugly packed away in the corbicula.

POLLINATION.

We should not fail to call the attention of our people to the great work of bees as pollinators of our fruit and vegetable bloom. If we have cold foggy weather all through the period of bloom of cherries or plums or pears, we shall have a very meager crop. Of course, it very seldom happens that we have no warm sunny days, but it does often happen that the days are so generally unfavorable that the crop is much reduced. It is gratifying to find that our fruit-men are coming quite generally to recognize this fact. I believe that the good work and exceeding importance of bees in this role of pollinators can not be too much emphasized or overestimated. I find that our cherry-growers are very anxious at the time of cherry-bloom, and are very happy if warm sunshine covers the entire period of bloom. The cherry crop is a very profitable one, and the loss of it is often very serious.

SAGE BLOOM.

Although we have no honey to date, yet we do not mourn as those without hope. The white and black (or bail) sage is coming on well; and if we have warm weather we may yet hope for a big crop. We must see to it that we have strong colonies to reap the benefit of later bloom and nectar.

First swarm April 24. A number of colonies have swarmed or prepared to swarm between that time and May 10, although the weather has been unfavorable a large part of the time, cool and cloudy. I do not know that I ever saw my bees in more uniformly strong condition at this season. As there was scarcely any loss of bees during the winter, it is likely that this season will see a return to something like the old number of bees in this valley.

A great many hold the theory that in a very open winter the bees fly so much and are so much more active generally that they consume more honey than they would in a winter somewhat colder. The past winter was very warm and open, scarcely any cold weather here, and most of the time the bees were flying every three or four days. Yet the lightest of my colonies had plenty of stores, and I have been obliged to take away solid combs of sealed honey from a number of my colonies this spring to make room for the queen to lay.

SWEET-CLOVER BLOSSOMS 285 DAYS FROM SEED.

I told you before something of the sweet-clover seed I planted last July. Three lots of seed were planted. Some of the ordinary white variety, some old seed of the yellow variety, and some seed of the yellow that was gathered July 18, all the planting being done some time between the 20th and 25th of July. The seed of the white was hulled, while the yellow was in its natural condition. The white clover came up very promptly, with a good thick stand, while the yellow did not germinate so well, having only a scattering stand. But this spring the seed that did not germinate last summer is growing finely and the old plants of both varieties are doing well, the ground planted to the white clover being covered with a heavy growth. The yellow seed had probably been covered a little deeper than the white. Whether the difference in germinating was due to this or to the fact that one was hulled and the other not, or a natural difference in the varieties, I do not know. I wish I did.

All this planting was done in an orchard where the ground has always been kept in a state of perfect cultivation, which shows that in Colorado at least there is no difficulty in getting sweet clover to grow in cultivated land.

The first blossoms of the yellow clover were seen May 5th, which would be 285 days or less from the time the seed was sown. Although a biennial plant, this particular lot of clover will have completed its life-history inside of a calendar year, using parts of two seasons. This shows the possibility of getting a full crop of blossoms on the same land each year. Ordinarily when sweet clover occupies the whole of the land there are not many blossoms except on alternate years, as the second-year plants cover and shade the ground so completely that no young plants are started that season.

It was my intention to plow under the white clover as soon as it was about a foot high, my main object in planting it being to furnish an object-lesson to the orchardists, many of whom are beginning to appreciate the value of green manuring and cover crops, but who can not yet be brought to look upon sweet clover as any thing but a nuisance. Alfalfa has been recommended for this purpose by our experiment-station men, but I believe sweet clover is in several respects far superior.

On account of a pressure of other work I did not get at the work until it was too high to plow under, so I will cut a crop of hay from it and then plow it under as soon as it has grown up again. The ground will then be cultivated until July, when I expect to plant another crop of sweet clover. If further experiments succeed as well as this I shall have shown the practicability of plowing under a heavy crop of clover on the same land every year. Any one familiar with the

use of leguminous plants for this purpose will readily see that this would prove sweet clover one of the most valuable plants to the agriculturist and especially to the orchardist. "But," you will say, "of what interest or value is this subject to the bee-keeper? Why try to get any one to raise sweet clover for the purpose of plowing it under before it blossoms?" For two reasons. In the first place, any thing that will help to remove the unreasoning prejudice that many entertain against sweet clover will be beneficial to the bee-keeper. If the farmer can be brought to see that sweet clover is a valuable plant in his fields, he will look at it with a more tolerant eye in the waste places. In the second place, if sweet clover should be largely raised for any purpose whatever it could be depended on that some of it would be allowed to bloom, for one reason or other. A great deal of seed would be raised, for one thing.

SPRAYING FRUIT-TREES—WHEN TO DO IT.

Some have criticised me a little for giving the fruit-man's side of the spraying question in the May 1st number, on the theory that it is not best to publish any thing that might be used against us. I feel, though, that it is best that we should post ourselves thoroughly on all sides of a question as important to us as this of spraying blossoming trees in order that we may better instruct the ignorant or combat the prejudiced or mistaken notions of the fruit-men. The successful general knows well how important it is to be informed as to the plans of the enemy.

It might well be charged against me that I did not go as fully into the matter as I might have, and I will try to remedy that now.

Fruit-trees are sprayed for several purposes —first, to combat injurious insects, of which the most important is the larva of the codling-moth or apple-worm. Other insect-pests for which spraying is done are the scale insects and the aphides. For these latter pests the spraying is best done when the trees are dormant, or if done at other times the sprays used are not poisonous, and there would be no object in spraying at or near the blossoming time, so these need not be considered further.

The second object of spraying is to cure or prevent various diseases, generally fungous in their nature, such as scab, rot, and mildew, which we do not have here to any extent, but which are more or less prevalent in the eastern States. The specific for these is spraying with a solution of a copper salt—sulphate of copper—in combination with lime, forming what is known as Bordeaux mixture. While this is of a poisonous nature it would not be specially destructive to bees. There is no advantage to the orchardist in using it at the blossoming time except that he may "kill two birds with one stone" by combining it with the spray used to poison the apple-worm. The only spraying then that is of importance to the bee-keeper is that which is done at the blossoming time for the purpose of poisoning the larvæ of the codling-moth. For this purpose an arsenical poison is used, such as Paris green, London purple, arsenite of lime, or the arsenite of lead. Orchardists here use only the two latter, with the preference given to the arsenite of lead.

The codling-moth lays its eggs on the leaves or bark of the tree. These do not hatch until some time after the blossoming period. After they hatch they make their way at once to the young apples and burrow into them. The object of spraying is to coat the apple with a poisonous covering so that the first few bites the worm makes into the apple may be its last. Spraying before blossoming would be of little or no advantage, since the apple is scarcely formed then. There would be no advantage in spraying until a couple of weeks after the blossoms had fallen, except for one thing. Sixty per cent of the worms, it is found, enter the apple at the blossom end. It is necessary then that there be a poisoned meal ready for him at this point. When the blossom opens, the sepals (the green leaves that form the calyx) are more or less folded backward along the stem of the apple. After the petals have fallen, the sepals begin to turn forward; and by a time varying somewhat with varieties and the weather, but seldom longer than a week, they have folded tightly over what we call the blossom end of the apple—the point where most of the worms make their entrance into the apple. Effective spraying requires that this vulnerable point of the apple be coated with poison before this closing of the calyx. To spray while the blossoms are still on will not do this as effectively as a little later, when the stamens and pistils are more or less withered, besides injuring these delicate organs and thus reducing the crop of fruit.

The very best time to spray is several days after the petals have fallen and the sepals have turned forward so that the calyx is a cup which will catch and hold as large a quantity as possible of the poisoned spray. The man who can get through with his spraying in two or three days is going against his own interests if he does not watch carefully this closing of the calyx and delay his spraying until it is in this cup-like shape that will best receive and hold the poisoned spray.

In the foregoing I have given the period for the closing of the calyx as it has been generally accepted here. Since writing this I have received a bulletin on the subject from the Illinois Experiment Station. While agreeing generally with the conclusions reached here, I notice that they extend this period somewhat, though they conclude that, on the average, orchards should be sprayed within seven days after the time that most of the petals have fallen. Observations here for the present season also indicate a somewhat longer period than has been considered correct before. From this it is evident that this time varies with locality and season, as well as with variety, and would probably average somewhat longer than I have indicated in the foregoing article.

This Illinois bulletin places even more

stress on the importance of getting the poisoned spray into the calyx cup, since with them nearly eighty per cent of wormy apples injured by the first brood of the codling moth have been entered from the calyx. What I want of bee-keepers is to fix firmly in mind this fact: That the main object of spraying at this time is to get the poisoned liquid into the calyx cup or blossom end of the apple, and be able to show careless or uninformed fruit-growers that they can not do this as effectively while the tree is in blossom as they can later, and that any time before the calyx has closed is better than while the petals are still on.

System simplifies the work: therefore, *have a system.*

A reputation for honest goods and honest dealing is bound to bring success. This should now be more easily done with the pure-food law to help us.

To many bee-keepers "a bee is a bee." When driving through the country, how many apiaries of pure Italians, Carniolans, or even all pure black or German bees do we see? Sometimes we run on to an occasional yard of a pure race; but more often there is a general mixture of a whole lot. This habit of swinging around from one breed to another, mixing and crossing, is not the way to get the most profitable results and satisfaction out of bees. Don't do it.

KEEPING COLONY RECORDS.

The star colony in a bee-keeper's apiary is the one that gives the most surplus honey and keeps it up the longest. By this test every one of us may test our colonies and try to bring all the rest up to its standard, or at least as nearly so as possible. A record should be kept of all colonies, each hive having a number. In offering an apiary of over 70 colonies of bees recently, the owner wrote: "I have every queen clipped, and every queen and colony numbered, and keep a record of them, and know of what strain each queen is, and what is the record of each colony." But how many bee-keepers think this worth while and do it?

MOVING WITH OPEN ENTRANCES.

We have tried moving bees in many ways, and with entrances open or closed in some way. The former is not to be recommended. Although some successes have been reported, there are too few of them. Open-entrance moving works all right under certain conditions, and *so long as you keep moving.* The bees cling to their hives well enough; but if a stop is made, the trouble begins. It is better to close the entrance. Use any of the simple hive-entrance closers that have been mentioned in these columns. One of the simplest ways we have ever used is to tear heavy burlap or some material of this kind into strips as long as the hive is wide, and about 2 inches in width. To close the entrance, simply fold it double and push it in with a piece of section box or a knife-blade. Eighty colonies were moved thus in warm weather, and remained closed up till 5 P.M., when, after the hives were all set on their new stands, the entrances were opened by running through the yard, and tearing out the strips of cloth.

EFFECTS UPON COLOR OF HONEYS.

Cotton is another plant which yields honey of different colors according to the different soils or localities in which it grows. The honey from cotton of luxuriant growth on rich black or alluvial river-bottom land is of very light color, while upland cotton, or that grown on sandy or clay soils, yields amber honey. It seems that the chemical conditions of the soil, the growth of the plant, and atmospheric conditions, all have some bearing upon the color of cotton honey. Certain chemical conditions of the soil may not only affect the plant-growth, but perhaps the juices of the plant itself, thus becoming apparent in the color of the honey. A plant of luxuriant growth yields nectar much more abundantly than those of less luxuriance. With dry climatic conditions, decreased secretion of nectar and evaporation to a certain extent takes place. Under such conditions honey from upland cotton, together with less luxuriant growth on poorer soils, would be dark in color. The best and lightest grades of honey will be secured from a luxuriant growth of cotton on rich soil during moist balmy weather.

THE GROCERY'S BEE.

Jimmy and Tommy were watching me over the fence as I was "knocking swarming on the head" at one of my out-yards. When through with the work I said to them, "Well, boys, do you all ever have honey over at your house?"

Said Jimmy, "Yes, sir; but we somehow don't like it very much any more now."

"But why, Jimmie? That's strange. You must not have good honey. Where did you get it?"

"Ma got it from the grocery," said he.

Now, I had an idea what the matter was, and so I asked the boys to have a taste of some *real* bee honey. This seemed to appeal to both of them. They fell right in, and after a good taste of it Jimmie said, "My! Tom, this *is* real bee honey; golly! how I wish our grocery had a bee!"

Since the workings of the pure-food law we can be sure that the "groceries" will

from now on "have a bee," and handle nothing but the pure article. Now let us, as bee-keepers, endeavor to furnish good well-ripened honey, for the "grocery's bee" alone will not make the satisfied customers.

AN IMPROVED STRAIN OF BEES.

While in the Beeville country (Texas) some time ago I ran on to what was known as the Atchley improved strain of bees; and many of the bee-keepers who had some of this strain in their yards claimed that this was an improved strain over others they had, especially for honey-gathering. I became inquisitive, and wanted to know how these bees were "fixed up," so I had Mr. Willie Atchley, of Beeville, write me about them. It will be remembered that Willie Atchley was at one time well known throughout beedom for his method of grafting queen-cups by transferring into them "baby, cradle, and all," from the old combs. He writes: "For the Atchley improved stock I cross, by mating daughters of pure Cyprian mothers to pure Carniolan drones. Then daughters from these queens are mated to pure Italian drones, and you have the Atchley strain. I use Cyprians for their get-up and get; Carniolans for gentleness and white cappings of comb honey, and Italians for compact brood-nest, non-swarming disposition, and color."

OH WHAT SHADE-BOARDS!

With one of the apiaries bought last year I got also a lot of about 50 shade-boards that were the most abominable curiosities. They were made of two pieces of full two-inch stuff, 36 inches long and 12 inches wide. These were cleated or nailed on to two pieces of 2×6×24 inches, and over the joint was nailed a piece of board 1×4×36 inches, and some even 6 inches wide. Although I have not heard of such, shade-board lifters would be almost a necessity where such shade-boards were used. As they are all made of heavy yellow pine they weigh from 50 to 70 lbs. each—more when wet. These cost about 75 cents each for material alone. Shade-boards are necessary when the hives are out in the sun; but they should be light and cheap. Sugar-barrels can be bought here for ten cents, and one will make three shade-boards 24×30 inches. The staves are simply nailed on to one piece of board 24 inches long, placed across the middle of the staves. A brick or small stone has to be used on these to hold them down; and as I use a brick for a "marker" on each hive, two birds are killed with one stone, and there is no objection to them.

Shade-boards, besides their use for shade, are valuable protectors to the covers of the hives, especially in hot climates where covers are drawn into all kinds of shapes. I have tried *all* the covers that have come to my notice; and while some are better than others, they all have to yield to the power of the elements as they exist in such a climate as we have here. For this reason I have sometimes thought seriously of using a protecting-board over the covers. Be these never so flimsy, they will lengthen the life of a cover considerably—enough so, I believe, to pay over and above for the extra cost of the boards and the trouble of having to handle them while on the hives.

TRAYS FOR MOVING BEES.

Those trays on page 555, for moving bees, are all right. I saw them used, some eight years ago, in moving 80 or more colonies over 40 miles of rough rocky roads, and all arrived in good condition except two combs broken in two colonies. The view on p. 555 is faulty in that it does not show two cleats nailed under the tray, one across each end, to raise it up an inch for ventilation, which is very important. The photo shown herewith was taken immediately after the colonies had been lifted out of the tray and set on their stands with the original hive-bottoms. The trays are still seen beside the hives.

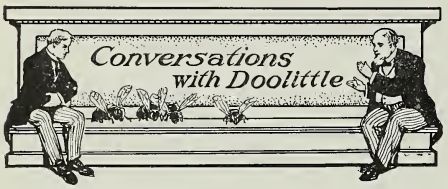
COLONIES JUST LIFTED OUT OF MOVING-TRAYS.

Concerning these trays Mr. Arthur Worden, of Sabinal, Uvalde Co., Texas, has this to say:

"I make a frame or bottom for each hive, just large enough for the hive to drop inside of cleats that run around the ends and sides of the frames. That will keep the hive from slipping about, and also keep the bees from getting out. In the bottom of these frames is left an opening 6 inches wide and the entire length, and screen wire is tacked over it. That will give plenty of ventilation. Also nail a one-inch cleat under the bottom, at each end, so as to let the air circulate underneath the hive when you place them in the wagon."

Nail your covers on so they will not jolt off, and set your hives into these frames, and you are ready to load. A spring wagon is best to use.

I think that ventilation from the bottom is much better than at the entrance, because there will be more light there than at the bottom, and the bees would naturally come to the light in trying to get out. I have known them to cluster at the entrance so close as to cut off all ventilation, and smother to death the whole colony.



HONEY PLANTS AND FLOWERS.

"I think I read in one of the bee-papers lately that the first pollen in Doolittle's locality was from the skunk-cabbage. Is this right, Mr. Doolittle?"

"Yes, Mr. Smith, that is right."

"Now don't think me impudent; but I want to ask how you know. I have hunted all about to see where my first pollen comes from, and I am inclined to think it is from the pussy willows."

"What makes you think it is from the willows? You live so near me that it would seem that your bees would get their first pollen from the same source mine do."

"Yes, and that is why I thought you were mistaken."

"But you have not answered my question regarding what made you think that your first pollen comes from the willows."

"My reason for so thinking is that this first pollen is of the same color as the bloom on the pussy willows."

"You are right as to the color; but did you find the pussy willows opened when this first pollen came in?"

"No. Neither did I find any other flowers open; but from the color of the pollen I judged that the pussy willows must be in blossom in some early-sheltered place."

"Do you have any skunk-cabbage?"

"Yes, it is quite plentiful over in my back lot, down on the swampy end of it. I went over there one day later on, but it was not even leaved out then. This was a week after I saw this first pollen coming in; and this was another reason why I thought you must be mistaken."

"Well, now, next spring when you see this first pollen coming in I want you to go over there and look for a little reddish-purple-colored hood-shaped thing from 2 to 2½ inches high; and when you have found one, just peer inside of this hood, when you will see a little round yellow ball, about the size of a marble, this ball being covered with little spikelets from which the pollen hangs; and if the day is favorable you will find from one to three bees in each of these little hoods gathering the pollen; and if you doubt that such is the blossom of the skunk-cabbage, just break off one of these purple hoods and smell of it. In looking in you will note that the space about this pollen-ball, between it and the hood, is very little more than that required by the bee, so that in gathering pollen from this source the bee becomes more or less dusted over with the pollen, often having about as much on its body as in its pollen-baskets. Did you notice whether the bees bringing the first pollen were dusted over or not?"

"Yes. I noticed that very many of them were."

"Exactly; and when you knew that the bees were working on pussy willow, did you ever notice their bodies covered with yellow dust?"

"Really, come to think of it, I do not so remember, which makes me think that you are right and myself wrong, after all. But the pussy willow comes on nearly as soon, does it not?"

"That depends on the weather. If it continues warm, then in a very few days the willows will open, and almost on their heels come the soft maples and the elms. But if cool weather comes on it may be two or three weeks after the skunk-cabbage before any more pollen is gotten. This cabbage is so early that it often gives the bees pollen before the snow is fairly gone."

"What flowers give the first honey?"

"The first nectar gathered comes from sap from the hard maples, from where the trees have been injured by frost, squirrels, or otherwise during the winter. If this injury is on the south side of the tree, the sap flows down over the bark, and the sun partially evaporates it till it is boiled down enough so the bees have quite a feast. Some years I go through the woods with a pole having a sharp spike on it and strike this into the trees on the south side some eight on ten feet from the ground, when, if the weather is right, the bees have a good time gathering this sweet, which helps much about early brood-rearing."

"Well, that is quite a scheme. I never thought of doing that. But about the flowers?"

"Before the sap scheme is fairly over, the woods flowers begin to open, such as the adder-tongue, liverwort, bethroot, etc., from which the bees get a little nectar, which helps a little on brood-rearing, but they never secure enough from any of these sources to store much in the combs. The first source of nectar which is gathered in sufficient quantities so we really get any honey from it comes from the white and golden willows, which intermingle their nectar with that from the hard maples, at which time, if the weather is right, a gain of from ten to fifteen pounds per colony is made, and the bees start out for the season in earnest."

"After these come the fruit bloom, black locust, raspberry, white and alsike clover, basswood, buckwheat, and fall flowers, in the order named."

"Yes, that is right, only you have missed some of the sources of honey."

"I guess not. What have I missed?"

"First, the wild mustard. This often gives a greater yield in this locality than white clover."

"How is that? How do you find out all of these things?"

"By using a little time and my eyes. Have you never noticed fields of grain yellow with the wild-mustard bloom just before the blossoming of white clover?"

"Yes; but I did not suppose the bees got any thing but pollen from that source."

"Did you ever go to these fields and watch the bees at work on them?"

"No."

"Had you done so you would have seen that the bees were lapping up the honey or nectar, rather than gathering pollen. But you must have noticed that some of your sections which you supposed were being filled with clover honey were quite dark after being finished, when you held them up before a strong light."

"Yes; but that darker honey came from the alsike clover."

"Oh, no! It was the mustard honey that gave the dark look. This I know, not only by causing the bees to give up their loads of nectar when working on the mustard, but by sections filled from this source when the clovers were not yielding nectar."

"What else is there which gives nectar that I did not mention?"

"Chestnut and whitewood (or tulip, as some call it); cultivated teasel, the second crop of red clover, and occasionally honey-dew, so called, coming from certain aphides."

"How did you find out about all these?"

"By following the bees till I found out these different flowers. One Sunday morning in the fore part of September, when I first awoke a little after the break of day I heard through the open window a great noise of bees in flight. My first thought was that I had left some sweet exposed, and a general robbing was going on, for the bees had been doing nothing for several days. I dressed quickly and rushed out, supposing I had a very undesirable job to look after before breakfast. Upon reaching the hives there was no sign of robbing, but the bees were pouring out and in, a large part of those coming in being so loaded that they fell short of the entrance. Before noon the work had ceased, and nothing more was done that day. The next morning I was astir with the first streak of daylight in the east, and, almost as soon as the bees could see, the excitement began, and the bees loaded with nectar came in as before. I started out and made a circuit of the apiary to find out which direction the bees went. Nearly all went in one direction, swinging round the house and shop (they were southwest of the house); they passed out over the lawn and road, going off to the northeast. A large piece of woodland lay in this direction, about three-fourths of a mile away in a direct line. I hitched up the horse, and started out; first east, passing under the line of flying bees; then at the next turn of the road I went north, and again passed under the bees. Again I turned east, and the third time passed beneath the bees, many of which were flying toward home with their loads only just above the buggy-top. I now drove through a lot to the woods, upon reaching which I found them working on the hickory-trees, and only on these. Climbing one that was low at the edge of the woods I found the upper sides of the leaves all sticky with sweet, which was thrown off by the aphides, which were feeding on the under side of the leaves above. After the sun had shown out for a spell the aphides seemed to cease throwing off this sweet or else the sun dried it up so the bees got nothing, while during the night, through the moisture, or a throwing-off of more, the leaves would be covered the next morning again, thus giving the bees work for a week, when a big rain came on, after which nothing more was obtained. But during that week the hives increased from 15 to 25 pounds each, which was the largest yield of so-called honey-dew I ever knew."

"And this is the way you find out what the bees are at work on?"

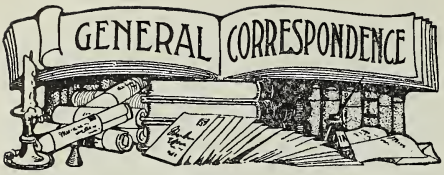
"Yes. That is something like the way I have tracked out all the sources from which bees gather nectar and pollen in this locality."

"Do you think you are any better off for knowing all the sources your bees secure honey and pollen from than you would be if you were ignorant of these matters?"

"I think this: If you would succeed, it is your *business* to know from just what plants and flowers your bees gather pollen and nectar, so you can put your maximum amount of bees and your honey-yielding flowers together. Then you have *success;* and the looking after the pollen bloom, as a source toward that maximum of bees on the stage of action, at the right time, bears no trifling relation to the matter. A thorough knowledge of your location is second only to having your bees in sufficient numbers to take advantage of the honey harvest when it comes."

FIVE-BANDERS NOT HARDY.

Mr. F. A. Lockhart, of Lake George, N. Y., in referring to the recent very unfavorable spring, draws attention to the fact that his five-banders suffered the most heavily of all. F. A. Salisbury, in the same mail, writes that his extra yellow stock are all "gone up." N. E. Cleaver, of Emporium, Pa., tells practically the same story. We have observed time and again that the five-banded or very yellow bees do not seem to be able for some reason to stand a severe winter or a bad spring, like the leather-colored stock. It has been suggested that this extra yellow blood is a sport from the Italians of southern Italy, and that the leather-colored Italians that do not sport to yellow are from northern Italy or Switzerland. If this be true, the tropical ancestry of the one and the cold mountainous environment of the other may account for the difference in hardiness.



HOW TO HANDLE BEES IN CLOSED-END FRAMES.

The Right and Wrong Way.

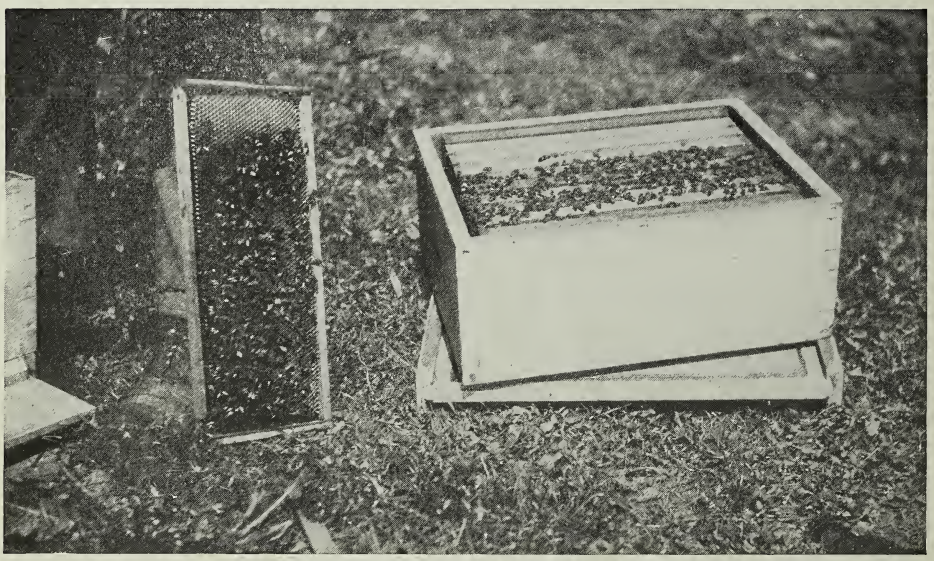
BY E. R. ROOT.

[Considerable interest is now being manifested in the subject of closed-end frames — especially so, as they have made so good a showing this backward spring. A good many have the idea that they are not only difficult to handle, but awful bee-smashers. In the hands of some people, perhaps the charge would be sustained; but, like every thing else, there is a right and a wrong way to handle them. As this has been fully explained (at least for one type of this frame) in a new booklet entirely rewritten by E. R. Root, entitled "Facts About Bees," we have thought best to reproduce here a chapter or two together with the special illustrations that were prepared, explaining the whole process.—ED.]

We will assume that you have a colony of bees in a hive, and that the same have been placed in the back yard. You will now desire to know how to open a hive and how to handle it. To open the hive blow three or four puffs of smoke into the entrance of the hive. This is to drive back the guards. With a screwdriver or hive tool enter the blade between the cover and the top of the hive or super as the case may be. Keep on crowding the blade until a little gap of about a sixteenth of an inch is formed. Blow a little smoke into this gap. Now give the screwdriver a slight downward pressure, thus making the gap wider. Blow in a little more smoke. Leave the screwdriver in place, with the right hand gently lifting the cover of the hive. We say "gently," because this is very important. A quick nervous jerky motion is liable to cause the bees to fly out and sting. As the cover is being lifted, with one hand blow a little smoke—not much—over the tops of the frames. Lay the cover down in the rear of the hive, bottom upward. If there is a super on the hive remove this in precisely the same way, prying the screwdriver between it and the lower part of the hive, in the mean time using a little smoke. The super should now be set down on the cover in such a way that the diagonally opposite corners just rest on the cleats. This will leave a space of about $\frac{3}{8}$ inch between the super and the cover.

In handling bees, always make it a point to avoid killing or smashing them. A bee that is crushed carelessly is liable, by its little squeals, to start the other bees.

Well, now we are ready to remove a comb. Pick up the screwdriver with one hand and the smoker with the other. Enter the blade between a pair of frames, and give it a slight twist, blowing a little smoke down between; next loosen the follower, after which it may be removed. Break the connections on each side of the frame to be removed, then set down the smoker and the screwdriver. With the balls of the fore fingers passed down between the ends of the hive and the frame, grab hold of the end-bars of the loosened frame. Very slowly lift it upward. If you find it still sticks, pry the frames on each



MANNER OF SETTING A HIVE ON A HIVE-COVER IN SUCH A WAY AS NOT TO KILL BEES; HOW A FRAME CAN BE LEANED AGAINST THE LEG.

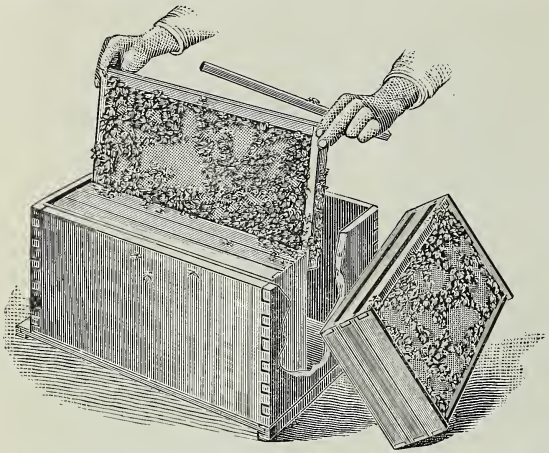
side a little further apart, when it should come out easily. When it is removed, look it over and set it down against the hive or some other object. Loosen up another frame to close the hive up. Put one frame in at a time; but in doing so be careful not to kill any bees. This can be done by sliding the edges that come in contact with each other

METHOD OF GRABBING CLOSED-END FRAME WHEN REMOVING IT FROM THE HIVE.

ABOUT TO INSERT A CLOSED-END FRAME INTO THE SPACE FROM WHICH IT CAME.
When in place, be sure to crowd the frames tightly together. This is important.

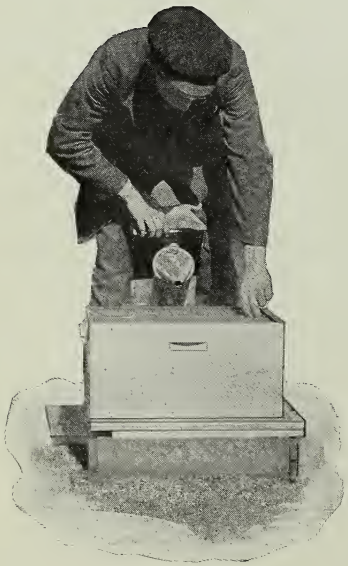
in the same way. After examining the brood and the young bees, and after having found the queen (she looks like the other bees, only she is a little larger and longer) then proceed *past each other on a perpendicular line*, as shown in the appended illustrations, in such a way as to brush the bees off; or, if preferred, a little smoke may be blown down be-

tween the edges that come in contact, driving the bees away; but if there are many bees in the hive this is impracticable. Insert all the frames one by one till all are in place, and then put back the follower.



[Note how the bees may be brushed away as the edges of the frames are slid past each other.]

As a general rule it is not necessary to remove *every* frame. The practical bee-man will soon learn how to tell from examination of a single frame what the whole colony is doing. If eggs and brood in various stages are found on the comb, it may be assumed that a queen is present. If the colony seems strong, and the bees are flying at the entrance vigorously to and from the fields it may be inferred that the queen is doing her full duty; so it is a general practice not to pull out more than one frame. If this is put right back into the slot from which it came, even if the end-bars are totally covered with bees, they will be brushed out of the way in the operation *and not a bee will be killed.*



Holding the smoker between the knees while handling the frames.

HOW TO MAKE AN ARTIFICIAL SWARM.

Suppose the colony has become so strong that you would like to make an artificial swarm by "dividing," as we say. Split the brood-nest into two or three divisions by means of the screwdriver and a little smoke. Each division of three or four frames held together by propolis connections can be removed in solid blocks and inserted in one or more empty hives; and in this way the colony will be divided into two or three parts. If empty frames of foundation be now placed on each side of the bees thus removed, we shall have the nucleus of a new colony; but it should be understood that the flying bees will go back to the old stand, and an effort should, therefore, be made to take the most of the bees away to the new stands, for the flying bees will soon go back and take care of any brood left at the old stand. In the course of two or three days an examination will show in which nucleus or division the queen is pres-

THE WRONG WAY TO HANDLE CLOSED-END FRAMES.

[The illustration shows the wrong way to handle closed-end frames. They should always be made to stand together in close contact of twos, threes, and fours. When so placed they will not tumble together in confusion, killing bees between the contact edges. The only way to straighten up a mess of this kind without killing bees, is to pick up one frame at a time and slide the edges of contact down past those of another frame; this will shove the bees out of the way without killing or maiming any. If, on the other hand, they be pushed up together on their points of support sidewise the killing of bees will be inevitable. To save time, the frames should always be handled in blocks of two or more.]

ent. If eggs are found, she is surely in that hive. If queen-cells are built, then just as surely she is not there. See how the bees supply themselves with a queen.

In these various manipulations, it will be seen it is not necessary to kill a single bee,

and, what is more, closed-end frames can be handled in blocks of two or three. When so handled, the several frames in each block are not pried apart where stuck together with natural bee-glue. With an ordinary unspaced Langstroth frame, a beginner, at least, would not be able to handle two or three frames at a time, for he would have to stick his fingers down between the several combs to keep them apart and from smashing bees, and run

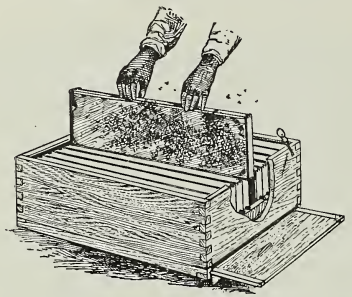
SLIDING A CLOSED-END FRAME DOWN BETWEEN TWO OTHERS.

[If the spacing be an easy fit, any bees that may be on the end-bars may be displaced without killing one. When all the frames are in place, *be sure to crowd them tightly together.* If left a little way apart, the bees will fill up the cracks with bee-glue, making separation afterward hard and disagreeable.]

HANDLING CLOSED-END FRAMES IN GROUPS OF THREE AT A TIME.

[This illustrates how the frames can be handled in blocks of two or three at a time. The propolis or bee-glue, holds them together while this is done. When the frames are in place, don't forget to crowd them up tight.]

the risk of being stung; and if he were stung he would be liable to drop the frames and be a sadder and wiser man therefor, and in all probability he would never want any thing more to do with bees. Right here a closed frame allows one to handle two or three at a time, without any danger of a catastrophe of this kind. The Hoffman frames can be handled in the same way, and with the same facility.



THE RIGHT WAY TO HANDLE DANZENBAKER FRAMES.

Closed-end frames should not be pried apart singly, but in blocks of two or more. When so handled, they will not tumble over against each other, as shown in illustration just preceding. When a single frame is taken out, the next adjoining ones should be pried a little apart from it. It may then be removed, and when inserted in the same way; and all bees that may in the meantime have crawled over the contact edges will be shoved out of the way as the frame descends into position. Notice that the pin-support is out of the way where it can crush no bees. When the frames are in place, crowd them together tightly to keep out the bee-glue.

HOW TO BUMP THE BEES OFF A COMB.

The method here shown (the Dr. Miller plan) illustrates one plan of jarring the bees off by a sharp quick blow of the fist on the back of the hand holding the frame.

FULL SHEETS OF FOUNDATION.

Naturally Built Comb Lasts only a Few Years; the Use of Queen-excluding Zinc.

BY C. W. DAYTON.

For about ten years I used full sheets of foundation in brood-frames; but about seven years ago I decided to let the bees build their own combs, as it was cheaper at the beginning, and I thought I could see methods by which I could compel the bees to build natural combs free enough from drone comb for practical purposes; but during the last two or three years I have been getting a decided leaning toward full sheets of foundation at all times. What a man may *think* has very little influence on what the bees will *do*.

They will build worker combs very nicely when new strong swarms are hived and there is a steady flow of honey from the flowers; but if these particular requisites happen to fall a little short, there may be very unsatisfactory work done. If some of the combs remain for completion the next spring it will be quite sure to be drone. New combs which are perfect do nicely for two or three years until they begin to be clogged with cocoons. Then they begin to tear down and add pieces here and there. Some comb gets moth and mouse eaten; some will contain pollen which, in damp weather, or in the outer corners of hives, will mold, thus causing patches and holes to be made clear through the combs to get it out. Robbers often tear holes through the combs in their strife for the honey. Then there are all kinds of accidents constantly happening, which break or tear a piece out of a comb. It is a small matter, seemingly, and we may promise to fix it; but it is usually neglected, and so on; and this constant routine, kept up for a few years, renders the combs in bad shape. We finally decide that the combs should receive a wholesale renewing, and we decide not to repeat the trial of natural combs again. That is my experience.

But if the frames were put up without holes for wire, at first, it will be difficult to pierce them after the frames have been nailed and in use. But the machine, as shown in the Feb. 15th issue of last year, will do the work.

It will not be best to make an entire change in a single season. The job is so great as almost to discourage one from continuance in the business. The best way is to renew about two combs in each colony every spring. As the bees are being built up for the harvest we have a good chance to see which are the combs in a colony which are in greatest need of rejection. Then if the two sheets of foundation are inserted the col-

ony will be considerably encouraged in drawing them out. I believe one of the helps to cause swarming is a brood-chamber full of old combs, and the presence of many drones another inducement.

ANOTHER METHOD OF SHAKING BEES OFF THE COMBS.

A strong hold on each edge of the frame is taken; it is then given a quick jerk downward and upward. If done right, it will dislodge all the bees.

For 100 colonies it would require 200 new frames, and for 200 colonies 400 new frames. It is best to keep these extra frames on hand, and prepare the foundation and frames for use at odd spells and rainy days and evenings when there is nothing else that can be agreeably worked with; and the job will not be so large but that it can be done without hiring help, as would be the case if it is put off until the arrival of the actual work in the apiary. When the season starts in, there is always enough to keep us more than busy in attending to swarms and arranging the receptacles for honey. If this work is brought into the kitchen, in small amounts at a time, the children can assist in some parts, and will soon learn to take an interest in it, and learn to notice just how each part must be done, in a certain invariable way.

The time of a farmer can usually be had at $1.50 to $2.50 at some seasons of the year: but at seeding time or thrashing it is worth $10 to $20. So in the honey harvest the bee-keeper needs all of his time and thought to care for the crop properly. A mistake may seem trivial at certain times; but if it has to be corrected in the rush of the season it becomes expensive.

One bee-keeper put in 5000 frames with inch starters, and without wire or holes for wires. Time will tell when he begins his career of tribulations. They think a day or two of cutting off the heads of drones will suffice. In an apiary of 300 or 400 colonies this work would almost keep one man busy. As soon as the heads are clipped once, the queen proceeds directly to replace them; and she will go into the upper story as soon as anywhere, to lay her drone eggs. I use excluders to keep the queen down, up to the time the honey-flow begins, when they can be taken off and there will be no further trouble. The honey seems to crowd the brood out.

As to excluders being used on the hives all the time, I would not. Still, I never could see but that the colonies having excluders on all the season got their supers filled as quickly as where the excluders were removed. Of course, it certainly is easier for the bees not to have the excluders on. There is about one queen in 25 which seems to prefer the upper story all the time. If a third story is put on she goes directly into that. If we let such queens have their own notions we should not get much honey from that colony; but if the queen is confined to the lower story we shall find the super filled just as compactly and neatly as any others. In such a case an excluder will save several dollars' worth of honey.

I have 150 excluders of the wood-zinc kind, and wish I had 150 more. We lose money, and that rapidly, to undertake to do without the necessary appliances. The next thing is to see their necessity. But a necessity is not always necessary all the time; and because it is not necessary all the time, many fool themselves by thinking they can be dispensed with *all* the time.

Chatsworth, Cal., March 25.

DANDELIONS FOR BEES.

A Land Flowing with Milk and Honey; Dandelions for Cows, etc.

BY A. I. ROOT.

I have just had one of my happy surprises. For a year past or more the children (and grandchildren) have been petitioning for a cow; but I said it would cost more to get a cow and care for her properly than to buy milk of the milkman, and so the matter was put off. Finally our teamster bargained for a half Holstein-Jersey cow during my absence. I said, "All right, boys, go ahead; but if you do not find your cow a white elephant in a few weeks I shall be much mistaken."

Of course, we expected to turn the cow out to pasture when the grass was up; but we do not have a fence on the ranch, so the matter was delayed while discussing the fence problem. Now let me digress to tell you that our orchard was for many years used for market gardening, and, as a consequence, it is well tile-drained and heavily manured with manure from the livery stables. The

last crop we put on it was potatoes under straw. The whole orchard was mulched heavily with wheat straw. As the season was very wet, the potato crop was partly a failure; but the straw rotted all over the ground. Mrs. Root said if it would only kill all the dandelions it would be a good investment. Well, the straw killed every thing *but* the dandelions. They pushed up through, and I doubt if anybody ever saw a better "stand" of dandelions. This spring, when the cow was bawling in the stable to get out, the dandelions were up and dressed, and just began to show their yellow blossoms Now, here is where my happy surprise came in. Perhaps I am stupid, and behind the times; but I did not know that a cow would *eat* dandelions. She was tied to a stake by means of a rope only a rod or two long, and put out to pasture. She soon gave us to understand that dandelions were the correct thing so far as *she* was concerned. Every bud and blossom was gathered up, and when the boys were bragging about more milk than would go into the biggest-sized tin pail (14-qt.) I said I could not believe that the milk could be good. But I am glad to tell you that the milk suits me in exactly the same way the dandelion-blossoms seemed to suit the cow, and we have more than a pailful of

DANDELIONS IN FULL BLOOM.

[The above is a glimpse of a four-acre lot on which I grew 375 bushels of potatoes per acre on the whole field. It illustrates what may be done with tile laid only two rods apart, and a heavy application of stable manure. When I spoke to our teamster about plowing it up and seeding it over again to get rid of the dandelions he said if I did it would spoil his best field for timothy hay, and he did not seem to think the dandelions early in the spring were much of a detriment to timothy that came on after the dandelions were all gone and out of sight. I wish our experiment stations would tell us what they think about this. Are not the dandelions worth for milch cows all they subtract from a growth of timothy that comes on later?—A. I. R.]

beautiful rich milk—twice a day. The neighbors told us that butter made from this kind of milk does not need any coloring, and I can well believe it. Now, the surprising thing to me is that, while people have been talking about waging war on the dandelion pest, nobody has said a word, so far as I can remember, about its value for milch cows. It makes a big feed quicker than any other plant I know of—away ahead of the clovers and grass. Along near the path of the steam-pipe that goes under ground from the factory to the house we have dandelions in bloom in March. Why have not dairymen and milkmen said something about this before, and utilized for early feed for cows this plant that has been called only a pest, so far as I can learn?

I have been expecting somebody would object to the *quality* of the milk; but in Rootville every individual, including grandpa and the babies, declares the milk is "without spot or blemish." I told Mr. Calvert I would take back all my objections to the cow. Our poultry-journals are talking about egg-machines—hens that are bred so particularly for eggs that they are literally a machine to convert all kinds of food into marketable eggs.

Well, this cow of ours in this little dandelion-orchard is the best "milk-machine" I ever saw or dreamed of. While the dandelions last, a very limited area of the plants we have in that orchard would keep the cow giving more than a pailful twice a day. I have been watching these things, and the places where she was staked one month ago now furnish us once more a pretty good feed of appetizing "dandelion greens."

Well, this orchard is not the only place where we have that tremendous crop of dandelions. Up on the hill where I succeeded in getting 375 bushels of potatoes to the acre, the dandelions stand more than knee-high, so thickly that it seems to me as if there would not be any chance for the grass. Mr. Bowman, our teamster, informs me

LARGE SPECIMENS OF DANDELION BLOSSOM, BUDS, AND LEAVES, FULL SIZE, AS THEY GROW AROUND MEDINA.

[This blossom measures, as will be seen, 2¾ inches across, and we have found many as large as 2¾ inches, and, once in a great while, 3 inches in diameter. The standard size of blossom is from 1¼ to 1½ inches.—Ed.]

that, after dandelions are past their season, he gets his best crop of timothy hay right on that very ground. During this cold backward spring the bees have been bringing in more honey and pollen from our acres of dandelions than I ever saw them before; and it looks to me now as if this plant that has been called only a pest is one of God's greatest and most precious gifts in making our Northern Ohio clay soil "a land flowing with milk and honey," and *both* at the same time.

Of course, I am aware that dandelions are grown in the East, especially in the region of Boston, for greens; but I have not heard much about it of late years. I think the doctors have called bleached dandelions (such as are grown especially for greens) a very wholesome vegetable. Now, I wish some of the milkmen would tell me whether our experience is an exception to the general rule. Is that cow an extra cow? and is our locality especially favorable for dandelions? or is the present backward spring especially favorable for the dandelions, for milk?

After the above was dictated I found that Ernest had also written an article in regard to dandelions for bees, but it covers somewhat different grounds, and we give it here.

DANDELIONS.

Their Economic Importance, Especially this Season.

BY E. R. ROOT.

The dandelion in the vicinity of Medina has made a most remarkable showing this spring. The cold backward season has been unfavorable for its growth; but during the first few days of warm weather it came out in all its glory. Our fields and our lawns were fairly yellow with it. It came out just in the nick of time. There was no fruit-bloom out then, and the way our bees swarmed upon it almost made us think of the roar on the basswoods of midsummer.

We have always regarded the dandelions as a sort of pest on our lawns; but recent authorities say that it is not a pest; that dandelion greens, dandelion roots, and even dandelion blossoms, are beginning to have some commercial value. Both the roots and the plants are sold at high prices in Cleveland to-day; and yet one of our great dailies, the Cleveland *Leader*, has just come out urging all schoolchildren in the city of Cleveland, with a population of half a million, nearly, to make war on the dandelion; and the children did turn out as one big army to destroy it, root and branch. Did they destroy it? The more they fight it the more they will spread it. Merely cutting off the plant an inch or so below the ground will only be the means of spreading it the more, for every vestige of the root must be destroyed—a thing practically impossible.

The warfare against the dandelion seems to be quite general. Governor Hoch, of Kansas, has organized a crusade against it; the *Gem State Rural* classes it as a nuisance on the lawns in Idaho; the *Pacific Rural Press* says it is gaining ground rapidly in California, and now the *Rural New-Yorker* says it is very common in the East. But in no case are the farmers complaining about the dandelion, for they realize its good fodder value for all kinds of stock.

As a matter of fact, the dandelion will grow luxuriantly on dry hard clay soils when the ordinary grasses would turn brown and die; in fact, dandelion likes a rather dry soil, and that suggests the means of its extermination, or, rather, we would say curtailment of its growth. A lawn should be frequently manured, and then rolled thoroughly, and seeded often with lawn-grass seed. This process, continued with frequent watering, will cause the dandelion to give place to the lawn grass to a great extent; but the various means used for cutting out dandelion do absolutely no good. They rather spread them, because, when the tops are cut off, the roots will divide up into more plants, making the lawn more numerously covered than before.

The editor of the *Rural New-Yorker*, Mr. H. W. Collingwood, one of the best authorities in the United States on agricultural subjects, in answer to correspondents in the last issue of his paper for May 18, asks, "Why exterminate it?" and then adds:

> Even if the extermination of dandelions in a given locality were not hopeless, why try to accomplish it? The plant has both beauty and utility. Tons of the leaves, both wild and cultivated, are used in early spring as pot-herbs, or salad, and most toothsome and welcome it is when properly prepared; the extract of the root and juice of flower-stalk are thought to have value as medicine, and the ground dried root has even been used as a tolerable substitute for coffee. Of the attractiveness of the bloom, there can be no doubt. Attentively considered, it will be seen that it is a model of symmetry. One might almost call it the one perfect flower. Nothing could be added or taken away without marring it. The only trouble is, it is far too common and unvariable.

The dandelion as a bee-plant is coming to be more and more important. It yields both pollen and honey at a time of year when they will do the most good. They usually precede fruit-bloom, and help to give the bees a stimulus that is very much needed just as they come out of winter quarters. While there is no such thing as dandelion honey on the market, and probably never will be, yet the little that is gathered, together with the pollen, goes to make brood at a time of the year when it counts.

While we have no desire at all to sing the praises of what may be regarded in some quarters as a pest, yet a great many valuable plants, as well as animals, have been condemned time and time again, only to find in after-years that they were really friends. Sweet clover is an example of this; and in the bird line we will mention that the crow, once regarded as a farmer's enemy, is now considered a real friend. He is a scavenger, and a gatherer of injurious insects, while the ever-present sparrow, also regarded as a general pest, is not altogether a nuisance; indeed, good authorities seriously question whether it does not do more good than harm in killing noxious insects, and acting as a

scavenger of the streets. Shall we then be in haste to condemn a beautiful plant, beautiful if it were not so common?

A SEASON'S WORK WITH SECTIONAL HIVES.

Swarm Control and Comb-honey Production; How to Find Queens Without Handling Frames; the Two-queen System of Honey-production.

BY J. E. HAND.

[The following article is of exceptional interest, for the reason that it touches on two somewhat debatable questions, namely, the feasibility of finding and catching a queen without touching a brood-frame, and working the two-queen system — that is, two queens in one hive.

It was R. L. Taylor who, some ten or twelve years ago, at one of our bee conventions stated that he could find and catch a queen without handling a frame; for he was then using, as he is now, a Heddon divisible-brood-chamber hive. His method, as we now recall it, was somewhat similar to that described by Mr. Hand. Mr. Heddon followed a different plan; getting the queen by shaking a section until the bees and queen fell out on the ground; but this was practicable only with black bees. In Europe the straw-skep bee-keepers have for years had various plans of getting their queens. We have no divisible-brood-chamber hives in our apiary just now or we would try Mr. Hand's method; but our Mr. W. K. Morrison, who has worked these hives for years, says the method is perfectly feasible, for he has worked it himself. In the *American Bee Journal* for May 30, J. E. Chambers has a scheme for trapping the queen without handling a frame. He is a user of a sectional hive.

Modern bee culture is progressing more and more into handling frames less and hives more, whether Langstroth in pattern or not; but it has been insisted on by the frame-handlers that queens could not be found and caught without pulling out the combs, and that meant taking frame after frame until the queen was located.

We are glad to bring this subject before our readers, and trust that, if any of them have practiced the Hand, Taylor, or Chambers method, they will let us hear from them as to how it works, whether a failure or success.

The other subject, the two-queen system, is receiving more and more prominence; and as so many have made a success of it, some conservatives, as well as the enthusiasts, may do well to give this their careful consideration. By the plan that Mr. Hand here works, he is not only able to produce a crop of honey in a poor locality, but manage a poultry-farm of some 600 or 700 chickens for, be it said, poultry is his principal business.

It will be noticed that he does not raise any question as to the success of any of the plans here advocated in the hands of others. But as he is able to make these short cuts, thereby making honey and money when some of the rest of us fall down, perhaps we would do well to sit at his feet, for he is a bee-keeper of many years' experience; and, like Gamaliel of old, he is willing to tell what he knows. Mr. Hand writes:]

We are now coming to the interesting part of our subject. We will, from this on, demonstrate by actual work in the apiary the arguments that we have advanced in our two former articles. Our apiary contains 152 colonies, 80 of which were wintered on their summer stands in winter cases, with sawdust packing. The rest, 72 colonies, were wintered in the cellar under our dwellinghouse. This is a most perfect wintering-cellar; however, last winter, for the first time, the mice worried the bees in the cellar, causing many to leave the hives and become lost. Our hives were wintered without bottom-boards. Hereafter, when wintering our bees in the cellar, our hives will be mouse-proof.

It is now May 10, and up to this time we have not loosened a cover to any of our hives since last September. Here is something worth remembering: Don't loosen the covers to your hives in early spring. It causes a great deal of heat to escape from the cluster that is so much needed at this time. Satisfy your curiosity by tipping the hive up on end and looking between the combs from the bottom. As the weather at this time is fine, and the bees are pouring into the hives laden with pollen of many hues, we are assured that they are breeding up; so we will now remove the winter-cases from the 80 colonies that were wintered on the summer stands.

The sawdust that was used for winter packing will serve an excellent purpose in keeping down the grass in front of the hives. This is important, for we must not allow a blade of grass or a weed to grow in front of our hives to hinder the flight of our bees. Having our winter cases removed and piled up in a row along the side of the apiary, we will now clip our queens.

While we do not expect to have any swarms issue, yet somehow a habit of 30 years' standing is hard to break; and as we wish to make an examination of the condition of every one of our colonies at this time, it is but little more trouble to clip our queens so that we can tell their age when we come to supersede them; for we do not aim to keep any queen longer than two seasons, and we will hereafter winter a queen only once, superseding all our queens each season just before the honey harvest. This practice will insure a vigorous queen in every colony, and will practically do away with tinkering up weak colonies in the spring. Every thing hinges on the queen. A vigorous young queen will keep laying late in the season, and will give you a strong force of young bees to go into winter quarters, which means a strong colony next spring, providing the apiarist does his part in providing ample protection for the colony during winter. Since we have adopted this plan with our poultry, our profits in egg-production have been greatly increased, and also the mortality in our flocks has been greatly lessened. We have no more use for an aged queen than for a moulting hen.

We believe that this matter of allowing the bees to supersede aged queens in the spring is a great loss to the honey-producer, and that, by requeening each year, it is possible to secure an approximate yield per colony for each individual colony in the apiary, instead of having a few colonies store our surplus, and the rest do nothing, as is too often the case. Perfect swarm control is not to be accomplished by a single stroke, but is the result of a careful removal of a combination of natural influences that lead up to swarming. Not the least of these is an aged queen, therefore requeening each year previous to the main honey-flow is a great aid to perfect swarm control.

HOW TO FIND A QUEEN IN A SECTIONAL HIVE WITHOUT HANDLING FRAMES.

We will give the *modus operandi* of clipping queens, for the benefit of certain ones who can not see how queens could be found, etc., without handling frames.

First, we will blow a little smoke into the hive-entrance; insert a hive-tool into the entrance. An upward jerk loosens the hive from the bottom-board. Tip the hive up on end and blow a little smoke in between the combs from the bottom. Now place the hive back on the bottom-board; quickly separate the brood sections, removing the top one, which contains the bees and queen, placing it on an empty hive-body or a box; remove the cover; and if the queen is not seen by glancing quickly over the top-bars of the brood-frames, look on the under side of the cover; if she is not there, place a queen-excluder on the lower brood-section. Now place the brood-section, having your bees and queen on the queen-excluder. A few puffs of smoke from the top down between the combs will quickly drive the bees below, leaving the queen on the excluder. You can now take your time to pick her up.

CLIPPING QUEENS.

There are several methods of clipping. We take the queen by the wings with the thumb and finger of the right hand; transfer to the left hand, letting her grasp the end of the second finger with her feet; gently close the thumb and front finger against her thorax, letting the abdomen hang down across the nail of the second finger. With a pair of sharp scissors clip the lace from the wing diagonally, so as not to cut the bone. A queen looks crippled with her wing cut square off; and, besides, it must injure her. The time required to catch and clip a queen by this method is about two minutes.

Having all our queens clipped, and carefully noted the condition of each colony as to numerical strength of bees, amount of brood, and also of honey, the condition of each colony is marked by placing a stone on the cover, the location of the stone on the cover telling at a glance the exact condition of each colony in the apiary. We find, by taking an inventory of our colonies, that we have 50 good strong colonies; 50 fair to medium ones, and 50 fair to light ones, and 2 are queenless. All the light ones were of the

FIG. 1.—FINDING QUEENS IN SECTIONAL HIVES WITHOUT HANDLING FRAMES.

The first operation, as shown in this illustration, is to tip up the front of the hive from the bottom-board and blow a few whiffs of smoke between the combs. The object of this is to drive the queen to the upper part of the hive. A glance at the illustration in the last issue, showing the construction of the sectional hive, will make it clear that there is an unobstructed passageway on account of the very narrow top and bottom-bars.

FIG. 2—FINDING QUEENS IN SECTIONAL HIVES WITHOUT HANDLING FRAMES.

Just after smoke is blown up through the combs, as explained under Fig. 1, the top section with the cover is set to one side where the cover is removed. The queen, in most cases, will be found either on the under side of the cover or on the top of the frames next to the cover, as indicated by the arrow-heads. The illustration shows the upper section in its place over the lower one; but Mr. Hand, in his article, states that it should be set to one side, obviously for the purpose of preventing the queen from dodging down into the lower section when the cover is removed. If the queen is not found in either of these two places, proceed as per the directions under the next illustration.

number that were wintered in the cellar. We think this is owing to the depredations of mice while in the cellar.

As we are going to work our apiary by the two-queen non-swarming system, we will now unite the 50 fair to light colonies with the 50 fair to medium ones.

UNITING BROOD-SECTIONS OF DIVISIBLE-BROOD-CHAMBER COLONIES.

Uniting colonies should be done just at evening, after the bees have nearly quit flying, so as to avoid any disturbance from robbers; and by the next morning the bees are thoroughly acquainted, and no robber can get a foothold.

We will remove the covers from 25 of the 50 medium colonies, placing on each a queen-excluding honey-board. We will next go to one of the fair to light colonies, tip it up from the bottom, blow a little smoke up into the frames from the bottom, driving the most of the bees up into the top section of the hive; drop the hive in position on the bottom-board, separate the brood-sections, placing the top one with the queen and brood and most of the bees on the top of one of the 25 prepared colonies, leaving the lower brood-sections, on which we will place the covers that formerly belonged to the prepared colonies. These queenless brood-sections, with the few bees that will return, will make excellent nuclei for the mating of queens, which always come handy in any well-regulated apiary.

We will now prepare the remaining 25 colonies each with queen-excluding honey-boards, and proceed as before until all are covered.

We have united 100 colonies of bees, and have removed the cover from only 50, and in less time than is required to tell how it is done.

THE TWO-QUEEN SYSTEM IN DIVISIBLE-BROOD-CHAMBER COLONIES.

An inventory of stock at this time shows that we have 50 good strong colonies (each having one queen and two brood-sections, these were the strongest colonies in the apiary, and each colony contains a vigorous queen) and 50 three-deckers, each having two queens with a queen-excluder to keep them apart, and 50 single brood-section nuclei.

Our object in having two queens in a hive is a twofold one. First, we must have very strong colonies if we expect to take advantage of our short honey-flow, which is often of only a few days' duration. We never had a colony that was too strong in bees at such a time.

Tinkering with weak colonies during the honey harvest by giving them brood from other colonies to get them in shape to do work in the supers may do for some locations; however, such loose methods are not to be considered for a moment in such a location as ours, and we very much doubt the expediency of such methods in *any* location.

Every one of our colonies must be ready to enter the sections — in fact, to crowd the supers full of bees right at the very beginning of the harvest. It is *bees* that we want at this juncture, for hives do not gather honey; and a hitch in our management at this time would mean a loss of dollars. Another advantage gained by the two-queen system is keeping the brood-chamber clear of honey. The two lower brood-sections occupied by one queen being in the heart of the brood-chamber, no honey will be stored here, for bees do not store honey below the brood, and will quickly remove any honey that may be so placed by the apiarist. The fertility of the queen in the top section being in excess of the room of the same, very little honey will stop here. This insures a brood-chamber full of brood, and practically free from honey, which will, together with other methods to be described further along, solve the problem of perfect swarm control in connection with comb-honey production. The 50 three-deckers with two queens are to be worked for comb honey by our new system of non-swarming, and the 50 strong single-queen colonies are to be worked for extracted honey. Later developments will show, however, that the *extracted* honey will go into

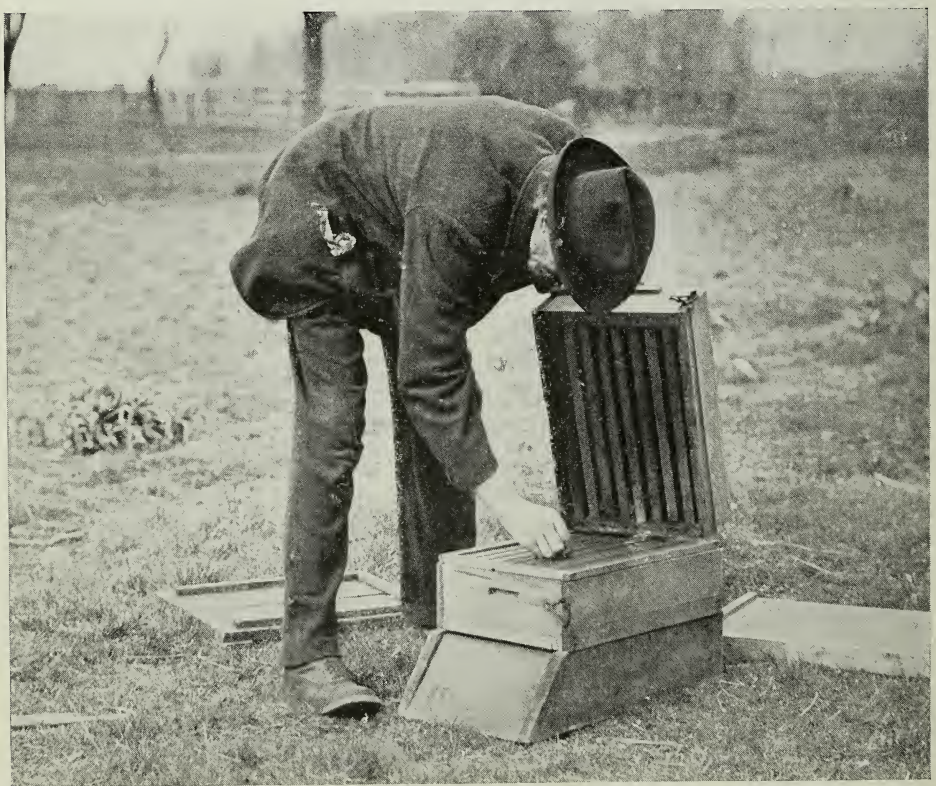


FIG. 3.—FINDING QUEENS IN SECTIONAL HIVES WITHOUT HANDLING FRAMES.

If the queen is not seen on the cover or tops of the frames (Fig. 2), a queen-excluder is put on the lower section, and the upper section placed over it. Then smoke is blown down between these upper frames, and the section tipped up as shown. The queen will nearly always be found on the excluder.

the sections, thus demonstrating the only system of perfect swarm control that has ever yet been given to the public in connection with comb-honey production. When I say *perfect swarm control* I mean a system that will keep the bees and brood together with no desire to swarm. I am not going to promise you a system of perfect swarm control and then give you an artificial swarm destitute of hatching brood that is continually becoming weakened by the loss of old bees, and *that* hived in a brood-chamber so contracted with honey as to compel the bees to swarm out the next day and the next, and so on.

Birmingham, Ohio.

BUILDING UP THE APIARY FOR THE MAIN HONEY-FLOW.

An Entirely Feasible Plan for a Season like this; how to Get a Profit out of a Lot of Weak Colonies; a Hopeful View of the Clover Prospects.

BY OREL L. HERSHISER.

[The subjoined article presents a plan that looks at least as if it should give good results to the extent that a profit would be secured on an investment that might otherwise give no returns or even a loss. There are some who have tried the Alexander plan of building up weak colonies, and failed. To all such the Hershiser method will commend itself. We are glad to present it, as it may not be too late to apply it this season.—ED.]

Heavy winter and spring losses are reported in many localities in the northern and eastern States and in Canada; and the colonies that have pulled through are in many cases greatly depleted. Without some special care and manipulation many apiarists will get very little benefit from the white-clover and other early honey-flows. However, if the bees are properly and promptly handled a fair crop is possible from colonies that have come through in such condition.

Having had previous occasions to practice all the ingenuity I possessed in order to turn to profitable account the depleted colonies in my apiaries, resulting from severe winter and spring conditions, my methods, if followed by others similarly circumstanced, may enable them to win success where conditions and prospects seem to promise naught but failure.

At this time of year, spring dwindling is practically at an end, and every colony with a handful of bees will build up as rapidly as possible, the rapidity depending largely upon the number of eggs the small number of bees are able to incubate and the brood they can nourish and keep warm. The egg-laying capacity of the queens in these weak colonies being in no way impaired, the problem is how best to turn them to profitable account in the production of eggs from which to rear the bees in time for the honey harvest. It will not do to "spread brood" in weak colonies; and it may be remarked in passing, that, to obtain beneficial results from "spreading brood" under any condition of the colony, requires good judgment.

The plan that I have found most fruitful of good results in getting the greatest benefit from these weak colonies is as follows:

Look the apiary over and make three classes of the colonies, the first of which will be all colonies which are or will be in first-class condition for the forthcoming white-clover honey harvest or the first main flow from whatever source. The second class will be all those colonies which will be of from one-half to two-thirds the required strength for this first main honey-flow; and the third class all the remaining weak colonies, with from a handful of bees to enough to cover two or three frames of brood.

Now go to one of these weak colonies of the third class and shake the bees from one or two of the combs into their own hive, selecting those combs with eggs and larvæ, but leaving with the weak colony the combs having the most capped brood. Now take these combs to one of the strong colonies of the first class, and exchange them for a like number of combs of hatching and capped brood, shaking off most of the bees, and being sure the queen remains in her hive. Now supply one of these combs of hatching brood to the colony of the third class from which the combs had been removed. If this colony has enough bees to take care of two frames of brood, both may be given; but if not, the other frame may be given to another of the third-class colonies. Proceed in like manner until all the third-class colonies have been supplied with one or two combs of hatching brood from the first-class colonies in exchange for the combs of eggs and uncapped larvæ from the third-class colonies, being careful not to give more brood to the third-class colonies than they can keep warm and cause to develop properly and normally. The result of this manipulation will be that the queens in the first-class colonies will almost immediately fill the exchanged frames with eggs, and the colony will be little, if any, the worse for having lost some of its capped brood at this time. On the other hand, the third-class colonies will, in three or four days, have become so strong, by reason of the rapidly hatching bees from the exchanged combs, as to cover one or two combs besides those containing brood. The queen will lay eggs in these exchanged combs as fast as the bees hatch, and in a very short time one or two of the frames adjacent to the exchanged frames will be filled with eggs. As fast as the combs of the third-class colonies are filled with eggs they are given to the colonies of the second class to build them up. It will be surprising to see how rapidly the colonies of the second class may thus be built up. Near the end of this building-up process, and when nearly all the second-class colonies have been brought to a condition of efficiency for the honey-flow, the third-class colonies may be divided into two classes, or, in other words, a part of them placed in the second class to be built up as were the others of the second class, and a few days later still another classification may be made, and the net result will be that seven-eighths or more of

the apiary may be made ready for the honey-flow. It has been the result of getting all the queens to laying to their fullest capacity, and providing a suitable nursery for the eggs and brood.

There is a specially good opportunity to get remarkable results from this system of manipulation this season; for, while brood-rearing has been retarded on account of cold weather, the same weather conditions have operated to keep back the white-clover growth, and also all other early-blooming honey-producing plants, the season in this locality being from two to three weeks late. Of course, as the season advances it will gradually readjust itself as to what might be termed the normal season, until in the fall the backward spring will no longer be noticeable on vegetation. But on the approach of warm settled weather bees will as rapidly catch up with the season if we provide the means of developing the eggs into bees as fast as our queens can lay them; which we all know is at a tremendous rate when the first settled warm weather comes, with apple-blossoms and other early flowers to supply the nectar which gives the proper stimulating effect to the bees; and if no nectar is coming in between fruit bloom and white clover, as is the case in most localities, feeding may be resorted to.

While the weather in this part of the world has been cool and the season backward, there has been no severe freezing weather this spring; and the clovers that survived the open winter look healthy and strong, and the even moisture with no drouths or excessive rains has saved every thing that had any roothold. We may, therefore, look for a vigorous growth of clover when warm weather finally sets in.

Let us, then, be hopeful and build up the weak colonies, and be in readiness with the "dish right side up" to catch the crop when it comes, for we are more likely than not to realize handsomely for all trouble and extra manipulation of the right kind in a season like this. Remember that a colony of bees is valuable to the apiarist who keeps bees for the honey they produce, only to the extent of the profits obtained therefrom. One hundred poor weak colonies may produce no profits whatever, and may be run at an actual loss for the season. But if fifty of them should be used to build up the other fifty into profit-producing colonies, a full crop, and possibly something in excess, might be obtained therefrom, and the entire hundred brought into condition for successful wintering. The net result would then be half a crop for the entire apiary instead of an absence of profits.

Buffalo, N. Y.

UNCLE SAM MEANS BUSINESS.

A DEALER in Detroit, who probably thought the pure-food laws did not amount to very much, was fined quite recently $5000 for falsely labeling oleomargerine in a manner contrary to the law of the United States.

COMB AND EXTRACTED HONEY FROM THE SAME SUPER.

The Control of Swarming in Colonies Run for Comb Honey; What to Do Just Before the Honey-flow.

BY E. D. TOWNSEND.

Continued from last issue.

At the commencement of the honey-flow, and on the day the first new honey is noticed in the hives, the extra combs we have given are removed and the light colonies united, after which a super is given, with the two drawn combs and sections with full sheets of foundation. About the only shifting of brood we ever attempt is done just previous to giving the supers. If we find a colony with much sealed honey along the top-bar of the brood-combs, we change places with the sections of the hive; that is, we place the one with honey in at the bottom, and the one with nothing but brood is lifted on top. In this way we get that desirable condition of having all brood and no honey between the brood-nest and sections.

All our sections were filled full of extra thin foundation, and arranged as I have explained above, with a drawn comb at each outside. There is no need of a shallow super of combs to induce the bees to enter the supers; some of the most obstinate swarms were given these supers, and they never failed to enter if they were in condition to work in an extracting-super.

With the Barber plan, a full set of shallow combs is given to start the bees to working above; then, when they get nicely started, this set of combs is removed and the super of sections given. This works well with a small per cent of the colonies, but in most cases the bees hesitate about going into the sections at the time the combs are removed. I am satisfied that right here is where the majority of the comb-honey colonies contract the swarming fever. With my management on the other hand the bees work nicely until the combs are removed; then they are quite liable to sulk for a few days, and this is something we can not afford to have going on at this stage of the honey season, when the bees of every colony should be doing their best.

Now with a solid comb clear from top to bottom, on both sides of the supers, no matter how high they are tiered, there is no break in the cluster, so to speak, when a super is lifted up, and an empty one given under. This continuous comb calls the bees into the last super immediately; it will not be fifteen minutes, after this second super is given, until there will be honey stored in it, and there is *no let-up*. The work goes right on, on down both sides of the super at once. In a day or two, with a favorable honey-flow they will be occupying the whole of the last super.

This is the way to produce premium honey; it starts the bees working every section in the super at the same time, with a vigor no other system ever anywhere approached. In my apiary last year only 30 colonies

swarmed, out of 84 worked for comb honey, last season. All were worked in two sections of the hive until swarming time; then those that swarmed were hived on the old stand, the old stock being left beside the new swarm for about a week, when they were moved to a new location and their flying bees allowed to return and go in with the new swarm. This is the Heddon plan of preventing after-swarms. The new swarms are hived on one section of the hive, which is five Langstroth-frame capacity, and in very hot weather an empty section of the hive is given under this section for the bees to cluster in; this is to prevent the bees from swarming out, and is removed in about three days, or as soon as the swarm is thoroughly established.

This hiving on a contracted brood-nest forces the bees into the supers. These supers are removed from the old colony to the new hive, before the swarm was hived, for we do not like to disturb a new swarm until about three days after hiving, as the bees are liable to swarm out if disturbed.

If in need of extra queens, or increase, these old colonies are broken into, for each half will have a good queen-cell. Usually, each half will have a cell which you can see without removing a frame; but it sometimes happens that the cells are all in one section of the hive, and in that case a frame is removed that has a good cell or two on it, and given to the half that has none.

GIVING EMPTY SUPERS; CENTER BAIT-COMBS VS. SIDE EXTRACTING-COMBS.

The second super can be given when the first is about half full, and should be placed *over* the first one. Then when the second super is ¼ to ⅓ full, raise up the first one, and place the second one under it. This plan works nicely, and is the one we usually follow. But the old plan of lifting up the partly filled super, and placing the empty one under it also works well with the super arranged with the two extracting combs at the sides.

Some, being accustomed to using a bait-section in the center of the super, will be tempted to try one comb in that position. In this case, much of the value of the system will be lost; i. e., with that plan, the bees will start in the center and finish the outside last. While the comb in the center starts the bees in the supers, it is much better to start them *first* in that part of the super that is usually the very last to be finished—the outside. It might seem to one who always placed baits in the center that the bees would hesitate about entering the super in which the baits are clear to the sides: but the fact is that they enter just about the same, whether the bait be in the center or at the sides.

If I were producing exhibition honey I would never raise a super to put empty ones underneath, but would place them over the partly filled ones. This gets the sections better filled and better capped. A combination comb and extracted super is an ideal one for this purpose, as the bees do not hesitate about working in the sections. This free and energetic work in the super is very essential to the production of fine honey. But for market the better way is to raise the first super after it is well started on top and place the empty one under it. When the season is two-thirds over, be very careful to give no more sections than the bees will be able to finish up and seal. The last supers given should never be placed below the partly filled ones, for at the last of the season, when the honey-flow is getting more scant every day, these last few sections would be finished and capped thin: such light weights are very unsatisfactory. Therefore, put the last super on top, and give only what the bees can finish. Any more room that might be necessary could be provided by giving a very few extracting combs. These, too, must be placed on top. Usually, instead of giving extracting-combs to the colonies that have sections to finish, the better way is to group the sections together on a few colonies to be finished—care being taken to select colonies that are working freely.

Extracting-combs are given to the colonies having no section work to do. In this way all are kept busy, and we have but few unfinished sections left at the close of the season.

FEEDING BACK UNFINISHED SECTIONS.

Speaking of unfinished sections reminds me that we have but little use for them; the wood is soiled at best; then the honey never looks quite as good as from brand-new sections. By "feeding back," and getting a few supers finished, we had less than a super of unfinished sections left from the crop of 1906, of 2300 lbs.

A kink in feeding back is to uncap that part of the section that is capped, and give the bees an opportunity to lengthen out all the cells to the same length and cap it all over new. When treated in this way the product can hardly be told from that just brought in from the field, and it is quite different from that fed as it came from the hive, with one end of the section capped thin and travel-stained finish while the other end is thick, with a brand-new capping.

This fed-back honey is cased up by itself and put into a carrier, and is shipped to market with the first order. Handling it in this way, we have never had any complaint of its candying before it was disposed of.

THE FINISHING-UP OF THE SEASON.

The last ten days of the honey-flow is a busy time with the successful comb-honey producer; for a man can find good profitable work in shifting supers here and there, to get them all finished before the close of the season.

The bee-escapes are kept busy during this period, for any supers that have a few finished sections should be removed, since the work will progress more slowly as the season draws to a close, and such sections will be travel-stained soon if not removed. Then we want to get our partly filled sections grouped together on those colonies that are doing good work, and this is the best way to do it.

By the time you get over the yard taking off finished sections, as likely as not you can go over it again, as the bees are capping fast, being crowded somewhat for room. This taking off and shifting of supers should continue until the flow stops; then in about a week, when the capping stops for want of honey to work with, the escape-boards are put on, and everything removed and sorted. Those that are not sealed this time are uncapped, put into supers, and fed back as I told you above.

GRADING AND CRATING.

Our 4×5 plain sections of comb honey are all cased up in the latest 20-section no-drip shipping-cases, the wood of the sections being scraped free from propolis and bee-stain. We are very careful in our grading. I tell the boys when commencing this job that, if they find a section that there is any question about, to put it in the next lower grade; in this way all our grades are just a little better than the rules call for. At first thought one would think there would be a loss by following this rule; but we make it even by charging a higher price than the ordinary honey sells for. A good article sells better, and gives better satisfaction, even at a much higher price, than the ordinary at one-third less price.

Shipping-cases should not be nailed until they are ready to be used, and then only what will be needed to hold the crop, for they soil very easily when exposed to the air and light.

When the honey is ready to be cased, ten of the shipping-cases may be placed on the scales and weighed. It is not necessary to put a single mark on the cases, but one-tenth of the weight of ten may be kept in mind, for this will be near enough to the weight of one for all practical purposes.

After the case of honey is weighed, the net weight and the grade should be marked on a small piece of card-board; then, should the dealer who buys the honey decide to sell by the case, or if, for any reason, he did not care to have the weight known, all he has to do is to pull out the one small tack that the card is fastened on with, leaving no sign of a mark on the case to indicate that the case was ever weighed. This is as it should be, for we want to deliver the case to the customer just as clean and free from pencil-marks as when it left the factory; and to do this it is also necessary to wrap the cases in good strong manilla paper before putting them into the carriers. The railroad company never sweeps out a car for honey to be shipped in, and, just as likely as not, the car (or cars if a long shipment) will have been used for coal or lime, or a dozen and one dirty things that we do not want our honey to come in contact with.

With a good strong carrier, and plenty of straw in the bottom for a cushion, and with the cases wrapped in paper, we usually get our honey to market in about as good shape as when it leaves our hands.

Remus, Mich.

THE SELECTION OF A BREEDING QUEEN.

On What Basis Shall the Choice be Made? the Importance of getting Rid of the Poorest Colonies in a Breeding-Apiary.

BY C. F. BENDER.

Mr. Holtermann's article on page 413 is a very clear statement of what we ought to know about our bees, and don't; but I rather doubt such knowledge being of very great use in the practical breeding of bees, even if we possessed it. I should like very much to know which of my queens produce the longest-lived workers, which bees would fly furthest, live on the smallest rations, resist unfavorable weather the best, carry the largest loads, or make the most trips. But even if I knew all these things I might yet be a little puzzled to know which queen to breed from if I had nothing else to judge by.

If we turn our attention to practical results, instead of looking for the causes of those results, the decision is much easier. We want the bees that will store the largest quantity of the most marketable honey, and they must be gentle enough so that we can handle them. Those are the requirements in a nutshell.

To take a case from my own practice: The season last year was nearly a failure, but I had one colony that produced honey to the value of $11.00, besides their own stores. The next best gave a net return of $6.00; several others of $5.00, or nearly that. It would be interesting to know what combination of qualities caused those bees to go so far above the average, but such knowledge would probably make no difference in the selection of a breeding-queen. As it happened, all the best colonies were gentle, and all were pure Italians, and so were more likely than hybrids to hold those qualities in the next generation. Other things being equal, of course the colony storing the greatest amount of honey would be chosen. But the best colony produced watery cappings, and so was not suitable for comb honey. The point I am aiming at now is this: That the qualities enumerated by Mr. Holtermann are important only as they affect the honey crop; and of the honey produced we have a ready means of judging.

In regard to controlling the drone parentage, I think the best we can do is to follow Dr. Miller's plan. If one has more than one apiary, keep all the best colonies at the home yard — that is, those that gave the best records the previous season. Then do all your queen-rearing at the home apiary, and let the drone question take care of itself. Where we have a hundred colonies in one place, the mating with drones from other sources will not exceed five per cent. If we are to make any improvement in our stock, it is quite as important to weed out the poorest as it is to breed from the best.

Newman, Ills.

OUTDOOR VS. INDOOR HIVE FEEDING.

My bees came out of the cellar in quite a weakened condition because of dysentery; and since they were set out the weather has been cold and freezing nearly every night through April, consequently they are little different than when set out the last week in March. It will require the best stimulative method to get them ready for the harvest. Most of the hives having tight bottom-boards I can not use the Alexander feeder, which I consider the best for building up colonies in the spring, as with them they can take in feed, rain or shine.

One yard is too far from home to be visited every day, so I am thinking of hanging up perforated five-gallon cans at each yard and filling them every other day, beginning now and continuing till clover blooms. A few questions.

1. Will you kindly tell me how large the perforations should be—what size of nail is best to make the holes, and how many holes should there be in the end of a can?

2. How many cans will be needed for an apiary of 90 colonies?

3. Will not the syrup drip out at night or on cool days when the bees are not gathering it, so that a tub will be needed under each can to catch the drippings?

Portage, Wis. A. C. ALLEN.

[Until settled warm weather comes on we would not advise outdoor feeding. Your better way would be to feed within the hive. This can be accomplished by putting on an upper story or comb-honey super and putting therein a feeder. If the weather be cool or chilly, cover the feeder with a blanket to hold the heat of the cluster down. After settled warm weather comes on, the outdoor method of feeding can be used to good advantage. A square can elevated in the air, as described in GLEANINGS, is as good as any thing. The holes pricked in the end of the can should be about the size of an ordinary pin—the smaller the better if you desire to keep bees busy a long time. This size will just about enable the bees to take up all the syrup in 48 hours. If you want them to take the feed slower, make the pin-holes smaller.

There will be no waste of syrup when the bees are not gathering it on cool days, because atmospheric pressure will hold the feed within the can until it is actually drawn out by the bees.

If you have a hundred colonies in a yard you would probably need two or three cans in order to provide all the bees with the necessary stores.

We wish to say, however, that outdoor feeding is rather hard on the bees that gather it. They will struggle against each other for the food, and this has a tendency to wear them out prematurely. In the early spring they should be saved all the effort possible until they are strong enough to stand a loss of bees that wear themselves out in going to an outdoor feeder.—ED.]

CAGED QUEENS IN UPPER STORIES; ALEXANDER PLAN FOR MAKING INCREASE.

Please tell me if I can keep queens in cages in upper stories ten days. I intend to divide by the Alexander system, and buy queens for new colonies. I should like to know if it would prevent swarming to put brood in the second story (as in the Alexander system), leaving them there, when no increase is desired, working the bees for extracted honey.

Farwell, Neb. C. H. KUHN.

[Yes, you can keep queens in cages in upper stories ten days, provided there are bees to attend to them.

The plan you mention does prevent swarming to a very great extent, and, possibly, altogether in your climate.—ED.]

EVERY MAN HIS OWN MASTER.

From 20 hives, worked for comb honey, I took 1000 lbs. in 1-lb. boxes. I use the Hoffman frame and $4\frac{1}{4}\times4\frac{1}{4}\times1\frac{1}{2}$ plain sections, but will not argue about the matter of whether I am right or wrong, with any one. I think the better way for bee-keepers is to use whatever bee-hive, frame, or section they like, and let others do the same.

Smyrna, Maine. BERTHA M. TIMONEY.

LOAF SUGAR FOR WINTER FEEDING.

I notice that Mr. Alexander on page 315, mentions the use of loaf sugar for winter use. I indorse it, as I have used it for five winters with no loss. I use the supers, and don't waste the sugar as it is not mussy.

New Durham, N. J. ROBT. DIGEN.

[Yes, but we must be careful not to get the sugar too moist. It should be given the bees in a shallow tray.—ED.]

UPPER ENTRANCES.

In GLEANINGS, page 573, Mr. Alexander says: "Also have a separate entrance for each hive." You would oblige me, friend Root, by giving me a short hint concerning the best way for making a separate entrance in a second or third deep story (Langstroth), and also in a shallow one (5⅝, for instance), without injuring the body of the hive.

Bochum, Germany. E. WESTPHAL.

[This may be accomplished by pushing the upper story back $\frac{1}{8}$ of an inch. Also, you may make an entrance through the hand-holes, which answers the purpose very well, and does not mutilate the hive.—ED.]

OUR HOMES

by A. I. ROOT

I am come that they might have life, and that they might have it more abundantly.—JOHN 10:10.

I presume it is generally considered that my text refers to spiritual life; but if I am correct it includes also physical life; and no one knows how intimately the two are connected just now. The follower of the Lord Jesus Christ thanks his Maker every day for giving him a human life to live. He regards it as a great and precious gift. I am sorry to say, however—in fact, you know it without my saying it—that there seems to be a tendency of late, I fear among all classes (and I might almost say all *ages*) to declare that life is *not* a boon nor a gift; and there are those who go so far as to reject this great and wondrous gift, and with rebellion and anarchy in their heart destroy the life that God gave.

Just now I am made happy a good many times a day by studying the lives of seven little animate bits of creation. I mean seven ducklings that are not yet 48 hours old. They are of the new Indian Runner variety. I made friends with the mother hen (just as I did down in Florida), learned her language, or a part of it, while she also learned mine or a part of it; and then I watched almost breathlessly to see how the ducklings would understand her language, and how well she would understand theirs. There was a hitch in their vocabulary, as you might suppose; but yet they managed to understand each other very well. It delighted my heart to see these ducklings, when they were but little more than 24 hours old, stand up on tiptoe, or pretty nearly that, flap their little wings, and in their own way give thanks to their Creator for having given *them* a life to live, or at least a glimpse of it.

Now, these little friends of mine, just *new* from the hand of the great Father, are not in the habit of saying grace before their meals, but they do almost invariably give thanks *after* they have had their rations of bread and milk (it is the same milk, friends, that the "dandelion cow" is furnishing in such great plenty).

After I wrote about my nature studies last winter with the chickens, several friends said I had better choose ducks for my next study—that there was something wonderfully interesting about the newly hatched ducklings, and I have found it so. They are as playful as a lot of kittens or puppies. They roll over each other, tip over backward, wag their bills—yes, and their tails too—in a most comical and knowing way; and with their funny little eyes glittering like beads they scan every object that is new to them, tap it with their bills, climb about over objects with their funny webbed feet, and all with a comical grace that I have never seen in any other animated creature. Their very innocence seems to invite a lot of vicious enemies. Several have already warned me that the rats or cats would get them if I didn't look out.

While amid surroundings that are familiar, with their foster-mother in sight, they are happy and very much at home; but when I took the whole lot in a tin pan, with a cloth thrown over it to show them around the factory, they became frightened and almost got into a panic. In one short day they had learned to know *me* and to permit me to handle them as I chose; but when it came to seeing other strange faces, they made me think of a baby that looks about in vain for the mother's face.

We are told that ducks make a wonderful physical growth. I think some book says that, under favorable circumstances, they may double in weight in just one week. Well, now, the mental certainly keeps pace with the physical. Even my chickens did not catch on and learn as quickly as do these ducklings. At first I gave them a good-sized dipper to drink out of; but every last duckling quickly decided, it seemed, that, "if a little is good, more *must* be better;" and after the first sip of delicious water they essayed to climb into the dipper, and in they went in spite of me. I finally brought a little stone watering crock for poultry, that permitted them to get only their heads in; but they get in it just as far as they can all the same. Of course, I shall give them water to swim in, in due time.

In my last talk, when I spoke about the five smooth pebbles that David selected, perhaps I did not make it quite plain; but it seems to me the pebbles God has indicated to me are the chickens (and ducks, of course), the bees and flowers, fruits, strawberries, if you choose, and the delicious apples that I am enjoying so much in my old age. When I use the word "enjoying" I mean seeing them grow and studying this wonderful thing of life as well as enjoying the daily food that comes with all these rural industries; and just now I can not think of any other one object in the wide world that might interest an invalid and arouse and kindle life and enthusiasm as will a brood of ducks. I do not know whether this Indian Runner strain has any more vigor, life, and intelligence than other ducks, but I begin to suspect it has.

Since I have had the matter in hand, I have been recalling the instances of invalids restored to health by these same outdoor enjoyments—the instances in which the terrible *giant* has been killed or driven away by the smooth harmless-looking pebbles God has in his infinite kindness and mercy revealed to me. In the strawberry-book you will find that some of our finest and most valuable varieties were originated and given to the world by J. F. Little, of Granton, Ontario, Canada. Physicians told him he was absolutely gone with consumption. His children, however, tried to get him interested in creating new varieties of strawberries If I am

correct his first work was done sitting on the ground. He was hardly able to stand up, much less to stand up and work. At first he worked only a little while—perhaps only a few minutes at a time; then he stretched himself out and rested in the sunshine; then he worked a little more, and so on. He not only got well, but lived to a good old age; and it was my fortune to meet him and talk with him later on, after the strawberry-book had been published.

Our older readers will recall the case of Mrs. Sarah J. Axtell, of Roseville, Ill., who, while she was a hopeless invalid confined to her bed, got hold of a copy of GLEANINGS and became so taken up with bees that her friends wheeled her chair up to a window where she could watch a hive of bees at work. To make a long story short, she soon got her lounge on the porch, sat up a little, then learned to open and close a hive. Later still she got up on her feet, and, after a year or two of this kind of gradual progress, accompanied with *constant prayer* and *faith in God*, she received strength to do an amount of work in the apiary that grew up around her that might appall a strong man. Then she and her husband together secured a crop of honey that astonished the world; and as a fitting token of her gratitude to the loving Father who gave her the strength and enthusiasm, she decided that the greater part of the money which she received from this immense crop of honey should be donated to foreign missions. The record of all this appeared in GLEANINGS for 1882, and it was also published in the form of a missionary tract.

Once more, at a recent poultry-keepers' convention down in Florida there were so many calls for a talk from a man who had recently met with wonderful success that he finally yielded, and he started out something like this:

"Friends, I am hardly fit to talk to, much less teach, veterans like those I see before and around me. The greater part of my life has been passed without even caring for or noticing chickens at all. Three or four years ago the doctors up north told me my lungs were gone with consumption so far that medical aid was out of the question. They suggested that I might live a little longer in the mild climate of Florida, especially if I would get into something that would keep me constantly out of doors. I commenced playing with chickens, and became interested. My interest increased, of course, when I found that I was making it a pecuniary success, and that is how it all started."

As this friend was not much of a speaker he was going to sit down here and stop; but a dozen voices called called out, "How about the consumption, Brother Blank? Did the chicken business cure it?"

He got up and laughingly replied, "Oh! I forgot to tell you that I got so busy with chickens I forgot all about consumption, and, as nearly as I can determine, the consumption forgot all about me. I am now, thanks to your beautiful climate and the chickens, a comparatively well man."

I suppose instances like the above could be multiplied indefinitely. On my recent visit to Northern Michigan I was told of a lady who was advised by her doctor that there was no hope for her if she kept on in the way she was going, and this doctor told her to try sleeping outdoors. One of the neighbors said he also insisted on her taking a buggy-ride of *twelve miles* every day in the year, winter and summer. She is now well and strong. I am told that a lady in our town has been for the last two years sleeping out on an upper veranda, winter and summer. When storms come from a particular direction with such force they might blow in upon her bedding, she has rubber blankets arranged to pull down as a protection from that one direction. Although her lungs were badly affected when she commenced the treatment she looks now as if she were strong and well; and I have been told that the affected lung has been almost completely healed. Of course, a faith in God and a faith in prayer should always accompany all such effort to regain health; but as nearly as I can determine many have found a new lease of life by simply complying with the directions I have tried to emphasize so strongly, out in the open air, and some outdoor employment that arouses interest and enthusiasm.

In the fore part of our article I have something to say in regard to people who deliberately throw away or destroy this precious gift of human life. Our good friend Emerson T. Abbott, editor of the *Modern Farmer and Busy Bee*, has a quaint way of putting things that is most remarkable, and at the same time he uses this quaint gift in a most forcible way for upholding righteousness, temperance, and purity. See what you think of this, which I clip from his paper for May:

> There is a great deal said in these times about "race suicide," but there are worse things than a failure to be born. The most suicidal thing we know any thing about so far as the life of a child is concerned is neglect. A child having come into the world is entitled, from those who have been instrumental in bringing it in, to something more than clothes to wear, a place to sleep, and something to eat. If a child is to be neglected as to the development of the higher elements of its nature, "it were better that it had not been born." A father said in our presence not long ago that he enjoyed a cigar, and at one time smoked, but he had not done so for a long time, and he presumed he never would again; and then after a moment's silence he continued: "I have two boys growing up, and I feel that I owe it to them to set them a proper example, so I quit." This father knew what life means, and "race suicide" in his home would be a misfortune, but not in all homes.

Amen, brother Abbott. If our people are brought up in the fear of the Lord, they will be likely, like the little ducks, to regard life as a wondrous and most precious gift; and I think they should be taught daily, as soon as they are able to comprehend it, to give thanks to God for giving them a life to live; and also to the dear Savior who left his home in heaven and came down here to earth that we might have that greater and more important spiritual life, and that we might have it more abundantly for his coming. The expresion, "a failure to be born," while it is a huge joke in one sense, in another it *ought* to awaken sacred and solemn thoughts.

THE INDIAN RUNNER DUCKS.

You may ask what these have to do with high-pressure gardening; but if you could see my little flock go for every bug, worm, and insect, as they are doing this morning, you would understand. I am told that ducks are the only fowls that will devour potato-bugs; but I have not yet had a chance to test it. Since what I have said of them in another column they have grown a little larger. When they were about three days old I had a curiosity to know what they would do with water. I accordingly borrowed Mrs. Root's largest wash-bowl (fortunately she was absent), filled it to the brim with warm water, and sat down to note proceedings. One duckling lifted up his head, got a view of the water, splashed his head in a few times, then with a most comical and dextrous movement he quickly slipped one of his dainty webbed feet on the edge of the bowl, and was in the water like a flash. The rest soon followed, and what a rejoicing they did have! After splashing and flopping their wings and making the water fly, one of them, following the promptings of that amazing and wonderful instinct, dove down under the water, and swam about the bowl with a speed almost incredible. Who taught him that he could get along faster *under* water than he could on the surface? The others soon followed suit, and then to my great surprise they executed a sort of Indian war-dance. They splashed the water nearly out of the bowl, and then shot out of it and circled about the room as if in a panic, hiding in different places as if some enemy were pursuing them. This I have since had reason to believe is a sort of play, just as two chickens will pretend to fight each other when they are the best friends in the world. Just now when my ducklings are not quite a week old they are my daily delight and enjoyment. Not only are the little fellows very handsome, but there seems to be a sort of comic grace in their awkward movements. Their inquisitive black eyes, as they stand upright almost like a human being, make one think of animated interrogation-points. I found much to study and rejoice over with my chickens in Florida; but the ducklings are a surprise and an unexpected revelation to me. These Indian runners have a fashion of standing up straight and flopping their wings so as to make one think they might almost be a link between quadrupeds and mankind. If you have a love for such things, do not fail, dear reader, to try at least one setting of Indian Runner duck eggs. Mine cost only $1.00 for eleven eggs, and they have been worth ever so *many* dollars to me already. I see they are advertised all over our land now, and our periodicals are having a good deal to say in regard to them. See the following extract from *Country Life in America* for June:

To me these sprightly active birds are most interesting of all the duck family. Their two-fold name denotes at once their origin and their habits. They are natives of the West Indies. They are alert and active, ever on the go, and their movements are more of a run than a walk, partaking little of the awkward waddle of ordinary ducks. The carriage is very erect. Its specialty is egg production. Given the chance, it makes eggs cheaply too: with a good range on pasture land, along brooks, ponds, bogs, etc., it secures a large part of its living during the open season. It has a strong homing instinct, and nightfall generally brings it back to its quarters.

F. H. VALENTINE.

Later, June 6.—The best duckling in the flock, that weighed 1½ ounces the day it was hatched, May 30, weighed, just one week later, 4 ounces. How is that for rapid growth? They have been outdoors, rain and shine, almost every day since they were hatched, and they have had all the bread and milk they would eat, every time they were hungry enough to go back to their feeding-place for it.

THE GREEN FLY AND OTHER INSECT PESTS ON HOUSE-PLANTS IN THE GREEN-HOUSE, ETC.

I do not like poisons around for killing rats and mice or insects, or for curing diseases or any thing else, if I can help it. In our potato-book Mr. T. B. Terry has told you it is ever so much better for the potato to get rid of the bugs by hand-picking early in the spring than to use Paris green—that is, when you can do so. Poisons are dangerous; and when they do cure or kill, at the same time they almost always damage something somewhere, more or less. This spring so far I have kept the green fly, mealy bugs, red spider, and every thing else, off the plants in my greenhouse without fumigation.

Let me say first, that I suppose most of you know already that ants do not injure plants directly—that is, the ants we have here in the Northern States. But they do a tremendous amount of harm by carrying the eggs and larvæ of insects, and distributing them all over the plants in order that they may gather the honey-dew from these same insects much in the same way we milk our cows. On this account we want to get rid of the ants at the same time we kill the aphides. All your plants that are in pots are very easily managed. Get a good-sized pail of hot water. Do not heat it above 120 or it will kill the plants; and unless it is up to 110 it is not apt to kill the vermin promptly. Just dip your plant, blossoms and all, in the hot water, and keep it in about ten seconds. Every living thing will be dead if you carefully follow directions, and few if any plants will be injured in a temperature not exceeding 120. Be sure your thermometer permits a run up to 120 or more or you will burst the tube. You had better have a good-sized pail of hot water, because it cools off so fast. A tea-kettle of hot water close by, however, will enable you to keep the temperature about right.

If you do not happen to have a thermometer, get the water just as hot as you can hold your hand in it, then drop the ants or insects on top of the water and see that it eventually kills them. This seems a little cruel, I know: but for that matter it is cruel to kill rats or mice; but we do not often stop, however, on that account. You want the water hot enough so that an ant will wiggle about a little and eventually die from the heat. If the temperature is high enough to kill the ants it will make sure work of the green fly or the different aphides, mealy bugs, red spider, etc., and it really makes the plants grow thriftier. If your temperature is too high you will see the effect on the tender new growth of your plants after a little time. With a little practice you can get the water just right so it will kill the pests and not harm the tender plant. Now, the ants that spread the mischief in the way I have explained are usually in the ground under the plants. The pots in my little greenhouse are all plunged in the soil up to their rim. This saves a great amount of watering. The soil is made very rich with manure, and this rather encourages the plants in pushing their roots down through the hole in the bottom of the pot. Whenever I see a plant doing extra fine I find the roots have found the hole through the bottom and have gotten down into the manure that we put under the surface of the bed every spring. Well, the ants usually get into the pots through this hole in the bottom, and there locate in the rich soil right under the pot. As there is nothing to kill down there that we care for, when you lift the pots out of their respective holes in the bed just drop a little boiling water into said cavity. It will kill the weed seeds and embryo weeds at the same time that it kills the ants.

When you put your plant in the pailful of hot water you should plunge it down to the rim of the pot. Now, if you find your plants so badly infested that insects go clear down to the surface of the soil, just knock it out of the pot and push the plant down into the water until the water strikes the surface of the soil. The only objection to letting it touch the dirt is that it will soon make your pail of water muddy, and you do not want dirty water on the foliage of your plants.

Now, the above plan will enable you to make every plant absolutely clean in just a few seconds; and if you keep a careful watch on your plants, and kill the first greenhouse fly or aphis that is visible on the young shoots you will not have very much trouble. A stitch in time saves nine with a vengeance in fighting insect pests. Plants out in the open ground are not apt to be affected in this way. There are, however, some exceptions. Last summer I found a Baby Rambler rosebush literally covered with the green aphis. I took my hot water in a big dishpan and bent the bush over so I could plunge it under the water. In that way I got rid of every green fly; but after a while some more gathered on the same bush. I was in a hurry at this second treatment, and did not stop to test the temperature, and it made my rosebush look sorry for a few days. I have tried pouring hot water on plants that can not very well be immersed; but it does not seem to work so well. The insect ought to be kept exposed to the heat, under water, for as much as ten seconds. The older the animal the longer it will need to be kept submerged. Of course, my plan would not be very profitable for the green bug that has been afflicting wheat-growers to such an extent as to raise the market price of wheat during the past spring. I hope our experiment stations will, however, give us a remedy in due time.

GROWING STRAWBERRIES IN BRADENTOWN, FLORIDA.

Our readers will remember that I have several times mentioned the name of E. B. Rood, of Bradentown, Fla., a prominent bee-keeper and strawberry-grower; and they will, therefore, be interested in the following clipping from *The Strawberry* for June, this year:

I have found the growing of strawberries in Florida both pleasant and profitable; but as I have been largely the pioneer in this section, I have had to blaze the way, and often without a compass or chain, and, as a result, in the earlier stages the course was zigzag.

I did not know the varieties to plant, and experimented with about fifteen before I found the one best suited to my conditions; viz., the Excelsior, a plant that will fruit and ripen early, even in cool weather, and produce a highly colored and firm berry. I commence picking about Thanksgiving, and continue to pick till May or even June.

I began to grow berries with the idea of shipping, and I am satisfied that I could ship profitably; but I found that few berries were grown in this county, and our own city of Bradentown and all the surrounding towns consume large quantities of berries at 25 or 30 cents per quart—your money in your fist, no berries to spoil on the way to market, and no commission man to fall out with.

I believe there are many such places in Florida where hundreds of dollars' worth of berries could be grown and sold profitably. This is because the same skill required to make a success of strawberries yields handsome returns in growing winter vegetables, $500 to $1000 per acre not being very uncommon. A thousand dollars per acre is my mark for strawberries; and while I have not yet reached it I believe it can be done. At any rate I intend to stick to berries as one of my specialties for a reasonably sure and remunerative crop.

One of my first serious difficulties was when to set out my plants. September and October, especially the latter month, were recommended, but I have found, after a dearly bought experience, that July and August, and up to September 15 possibly, are much preferable, and I must grow my own plants, I think, from plants imported from further north the spring previous. However, I am not sure of this, and am now doing some experimenting along this line.

Then I suffered from cut-worms. If I had had the remedy *The Strawberry* now gives, Paris green, shorts, and honey (I am a bee-keeper), it would have been worth hundreds of dollars to me; but the book I had, written by a man claiming to be an expert, said the only remedy was previous clean culture, and so the cut-worms nearly ate me up.

What a wonderful advantage there is in beginning in any calling where the other fellow left off! and, with the splendid strawberry literature you are giving us, this is largely possible for the growers of the finest fruit in the world.

I think that strawberry-growing has a fine future in this section, as we can produce magnificent crops of fruit for many months when the greater part of our country has gone into winter quarters.

Bradentown, Fla. E. B. ROOD.

I might mention the fact that I have recently purchased an acre of land adjoining

friend Rood; and Mrs. Root and I are planning to spend our winters in the future in that locality, about twenty miles distant from our island home where we have been for the past two winters.

KILLING WEEDS WITH CHEMICALS.

Most of you have probably heard the wonderful things that are going to be or have been accomplished by the use of secret preparations that kill the weeds, especially charlock, wild mustard, etc. This is not particularly new. Some time ago T. B. Terry told us in the *Practical Farmer* about destroying weeds on his gravel walks, drives, etc., by using copperas—using 7 to 9 lbs. to the barrel of water. Just now chemical weed-killers are being extensively advertised, with big claims, and at a big price for material. The Pennsylvania Experiment Station has made careful tests, and analyzed the secret compounds. It is ordinary green vitriol, worth from $2.75 to $3.00 per 100 lbs , in quantity, roasted until a good deal of the water is expelled, leaving it in shape of a white powder. This roasting process does really make it more effective as a weed-killer, and no doubt it may prove to be an important aid in growing many crops. If it would only kill *dandelions* as well as mustard and other things it would certainly be a boon for use on our lawns.

KILLING DANDELIONS—SPECIAL TREATMENT.

Since dictating the above I learn from the *Gem State Rural* that the Idaho Experiment Station has succeeded in killing the dandelions by the use of 2 lbs. of copperas to a gallon of water, with the addition of 2½ lbs. of sulphuric acid. This certainly ought to kill the dandelions, and they leave us to infer that it will not kill the grass on the lawn. If it is true, it is probably the cheapest way to get the dandelions out of your lawn—in fact, about the only way if I am correct.

T. W. BRYAN, OF FICKLIN, ILL.

It looks just now as if we should have to keep a standing warning against this man swindling those who are interested in bee culture. The following letter is a sample of the ones we are getting right along, and below are some extracts from the papers that Bryan is sending out:

Mr. A. I. Root:—Enclosed please find T. W. Bryan's letter and circular, of which I wish your opinion. I am an old customer of yours, and I believe you will tell me the truth. I doubt what Mr. Bryan says, and surely if he has such a good thing you have heard something about it. E. BAUSERMAN.

Edinburg, Va.

BEES! BEES! BEES!

Do you love nice golden honey? Then let me teach you how to attract and catch large swarms of bees which will make you $15.00 to $20.00 a swarm this season.

I want every man, woman, boy, and girl in this country to know that my booklet, which was copyrighted in 1904, will teach them just how to prepare and fit up empty bee-hives packed in your own dooryard, which will attract large swarms of bees for miles, and then catch all the bees you may want, for nothing.

My plan of handling bees is entirely new and complete; does away with the old-fogy way of waiting and watching for your bees to swarm. Please remember that empty bee-hives fitted up according to instructions in my booklet always attract and catch the swarms, therefore they will hive themselves, which cuts out all possibility of any one getting stung by the bees.

The early bird catches the worm. Just so in catching bee-swarms. Send one dollar for booklet entitled "The Art and Secret of Attracting and Catching Swarms of Bees."

Address T. W. BRYAN,
Ficklin, Ill.

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Let me repeat what I have said on these pages over and over again. Mr Bryan's secret is no secret at all. His dollar book is a little bit of paper pamphlet, and his great secret occupies only a part of one of the small pages. First you are to hitch a red rag to the hive you want the bees to come into. Second, you are to scent it with anise. Well, any bee-keeper will tell you that runaway swarms go into empty hives without the red flag, or the scent of anise, more or less, every season, and it is, therefore, not at all strange they get into his "decoy" hives occasionally, and from these people he gets his testimonials. He is very careful not to advertise in any of the bee-journals. Our bee-papers, and agricultural journals also, will do the public a great service by warning their readers against this swindle. It is high time that the Department forbid this man the use of the mails. The "early bird that catches the worm" is Mr. Bryan himself in getting dollars from unsuspecting people who are not posted.

SALOONS OR SPEAKEASIES—WHICH DO THE MORE MISCHIEF?

I suppose you are aware there are a lot of people who argue that we had better have open saloons, and get a revenue (?) from them than to have blind tigers, etc. Dr. Young, the celebrated orator (the Henry Clay of Kentucky), recently said in a temperance address:

Who can get liquor from a saloon? Anybody, almost, and all he can pay for. True, the saloon-keeper has sworn not to sell to minors nor to persons of known intemperate habits; but, all the same, they get it. But who can get liquor from a blind tiger? Only persons whom the keeper believes to be those who would swear to a lie before a jury.

The above clipping comes from the *Alabama Citizen*, the organ of the Alabama Anti-saloon League. A *blind* tiger is bad enough; but a tiger with his eyes *wide open*, and licensed by the government of the United States to *kill*, is ever so much worse.

PRESIDENT ROOSEVELT ADDRESSES THE MICHIGAN AGRICULTURAL COLLEGE ON THE OCCASION OF ITS RECENT SEMI-CENTENNIAL CELEBRATION.

We make the following brief extracts from his talk:

"No growth of cities and no growth of work can make up for loss in number and character of farming population.'

"The bulk of people should work with both head and hand."

"Progress can not permanently consist in abandonment of physical labor, but in the development of physical labor so that it shall represent the work of the trained mind in the trained body."

"We must have a higher plane of efficiency and reward with consequent increased growth of dignity for the wage-worker."

"We must develop a system under which each citizen shall be trained as an economic unit."

"The greatest of crops is the crop of children."

Permit us to say amen to all of the above, and especially amen to its concluding sentence.

JAPANESE BUCKWHEAT.

We have a very limited supply of Japanese buckwheat seed. If any one reading this knows of a stock of choice seed for sale we should be pleased to hear of it. Until further notice we shall have to make our price, including bag to ship in, 40 cts. per peck; 75 cts. per ½ bushel; $1.40 per bushel; $2.50 for two bushels.

SECOND-HAND 60-LB. CANS.

We have on hand from 100 to 200 boxes of good second-hand 60-lb. honey-cans, two in a box. The cans are free from rust on the inside, and very little on the outside. The boxes are repaired and in good condition. We offer these in 5-box lots or over at 40 cts. a box; 25 boxes at 35 cts. a box; 50 boxes at 30 cts a box. These prices are for shipment from Medina only.

HALF-POUND TUMBLERS.

In making up the two pages of honey-packages in our catalog this year we omitted the half-pound tumbler. We have these packed 32 dozen to the barrel at $5.50 per barrel, or packed in partitioned cases of four dozen each, ready to reship when the tumblers are filled with honey, without additional packing; parchment or wax-paper discs also included; $1.00 per case; 10 cases at 95 cts.; 25 cases or over at 90 cts.

BUSINESS IMPROVING.

As we go to press we are having the first real summer weather since the latter part of March, and prospects are much improved in consequence. Those bee-keepers who have looked after their bees to see that they were not allowed to starve for lack of feed are hopeful of a honey crop, as the season is fully three to four weeks later than usual in many localities. Orders are doing very well considering all the conditions. We are in position to serve you promptly.

ONE AND FIVE GALLON CANS.

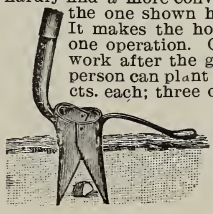
We have an extra large stock of one and five gallon cans which we offer, to reduce stock, for shipment from Medina only, at the following prices: One-gallon cans, with 1¾-inch screw-cap, $10.00 per 100; 500 or over, at $9 00. Packed 10 in a case at $1.30; 10 cases or over, at $1.20. Five-gallon (60-lb.) cans packed two in a case, 75 c. per box; $7.20 for 10 boxes; 25 boxes or over at 70 cts. This offer is for only a limited time to reduce stock, and you should mention it in ordering.

FURTHER DECLINE IN BEESWAX.

From quotations received from wax-dealers we note a decline of 2½ to 3 cents per lb. in the last six weeks. The light demand for foundation during the same time (due to unfavorable weather) leaves us with a large stock—more than we shall need for the next six months—of light demand. We therefore mark our prices down to 28 cents cash, 30 cents trade, for average wax delivered here or at our branch offices. We offer for sale about 5000 lbs. Santiago Cuban beeswax, unrefined, at 34 cents; 100-lb. lots or more at 33 cents; Calcutta East India wax, about 200 lbs. to case, at the same price.

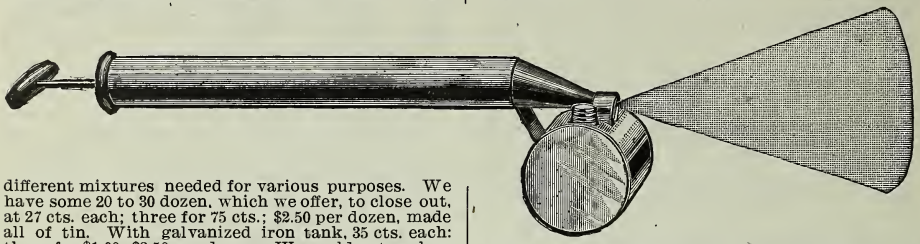
ACME HAND POTATO-PLANTER.

The time is here for potato-planting, and you will hardly find a more convenient tool for planting than the one shown here, especially in light soil. It makes the holes, and drops and covers at one operation. Once over the field does the work after the ground has been fitted. One person can plant two acres in a day. Price 55 cts. each; three or more at 50 cts.; a crate of one dozen for $5.25. We also have special bags fitted with straps for holding the potatoes while using the planter, which we can furnish at 50 c. each, or $4.50 per dozen.



FAULTLESS SPRAYERS.

This is one of the most useful little implements ever invented, and this is the time of year when it is needed to spray shrubs, plants, and especially potato-vines, to kill the bugs. It is also used as a kerosene sprayer on cattle to keep off flies. They are so cheap that you should have several, each loaded with the different mixtures needed for various purposes. We have some 20 to 30 dozen, which we offer, to close out, at 27 cts. each; three for 75 cts.; $2.50 per dozen, made all of tin. With galvanized iron tank, 35 cts. each: three for $1.00; $3.50 per dozen. We could not replace this stock to sell at these prices. Some of our dealers also have a supply on hand.



A B C OF BEE CULTURE.

Our stock of the last (1905) edition of the A B C of Bee Culture is getting very low, and we have been cutting down on all large orders for some time to make the stock last as long as possible. We have got fairly started on the new edition; but with the great amount of work necessary to complete it we shall hardly have any ready to furnish before September at least, and it may be later. If any dealers or agents or others have extra copies which you are not likely to dispose of before the new edition is ready, will you kindly notify us, and we will furnish orders for them.

The new edition is being printed on enameled book paper, and will be about one-fourth heavier than any former edition. It will be by all odds the finest edition ever issued. It will cost us more than 25 per cent more to produce it, and we have decided to increase the price to $1.50 postpaid, or $1.25 shipped with other goods. Orders already booked for the new edition at the old price will, of course, be filled. The wholesale and jobbing price is also advanced in proportion.

SPECIAL BARGAINS IN OLD-STYLE STOCK.

We are making some special offers on some old-style goods at some of our branches, which we desire to close out. There are some who prefer some of these older patterns to those adopted since, as we frequently find. To such this is an excellent chance to secure some goods of your choice at special prices.

At our Washington branch we offer:

77 eight-frame covers, Danz., flat metal-bound, which were standard three or four years ago. They are put together, all ready for use when painted. Price 25 cts. each; 10 for $2.20, or the lot at 20 cts. each.

197 ten-frame size, same style, at same price.

60 eight-frame bottom-boards, Danz. style of 1903, with metal-bound tilting floor-board—very convenient for cleaning. Price of either size, 20 cts. each; $1.70 for ten, or 15 cts. each for the lot.

50 hive-stands with slanting front, not now listed in our catalog. Price 12 cts. each; $1.00 for 10.

25 hive-stands of an older pattern, without slanting front. Price 10 cts. each; 80 cts. for 10.

At our Philadelphia branch we offer:

89 eight-frame and 500 ten-frame Danz. flat covers, metal bound on ends, same as those at Washington. Price 25 cts. each; $2.20 for 10; $20.00 for 100.

10,000 thick-top staple-spaced frames, with end and bottom bars ⅞ wide by ¼ inch thick; otherwise they are just like our present style. Price $2.25 per 100; $10 per case of 500.

Of our regular pattern, all-wood frames, we have an overstock, which we offer, to reduce it, at $1.75 per 100; $7.50 per box of 500.

An overstock of regular B. bottoms, ten-frame size, not reversible, 20 cts. each; $1.80 for 10; $17.00 per 100.

Overstock of 10-inch 4-row shipping-cases, with 3-inch glass, at $8.00 per crate of 50; hold 24 sections, 4¼ x1½ plain; also of 10-inch 2-row shipping-cases, with 3-inch glass, at $4.50 per crate of 50.

We have at Chicago several hundred slotted section-holders, nailed, which have been used and taken back in exchange for other style of fixtures. These new cost $2.00 per 100 in the flat. We offer these nailed, ready for use, packed for shipment, at $1.25 per 100, while they last. While they are somewhat stained with propolis from use, they are a bargain at this price to any one needing this style of section-holder.

We have in stock in Ogden, Utah, to dispose of, 300 thick-top staple-spaced frames at $2.50 per 100; 300 all-wood frames at $2.00 per 100; 2 No. 4 Novice extractors at $8.50 each; 1 bee-tent at $1.75; 250 folding cartons for 4¼ x 1⅞ sections, $1.25; 1000 cartons, wrappers, labels, etc., for brick honey, at $10.00. These goods are offered free on board at Ogden at catalog prices as above, less 10 per cent discount for prompt cash order to close out the stock quick.

Special Notices by A. I. Root.

DWARF ESSEX RAPE—ADVANCE IN PRICE.

I am sorry to tell you that dwarf Essex rape has advanced so much in price that we can not now buy it—that is, a good article—for the price we have offered in our seed catalog. The best price we could make at present would be, 1 lb., by mail, 20 cts.; 50 lbs., by freight or express, 7 cts.; 100 lbs. at 6 cts. It can be shipped either from here or Chicago. It may be sown in June, July, or August. A leaflet in regard to its value will be mailed on application.

FIGHTING RATS.

We are pleased to receive from the Department of Agriculture Bulletin No. 297, entitled, "Methods for Destroying Rats." I have several times petitioned for something of this kind from our experiment stations or the Department at Washington. I learn from the bulletin that rats sometimes gnaw through lead pipe, thus flooding buildings. They also eat the insulation from electric wires, thus causing disastrous fires, besides disseminating contagious diseases. They breed from three to six times a year, and the females breed when about three months old. The average litter is about ten. Particular emphasis is given in this bulletin toward constructing rat-proof buildings—those of concrete, etc. The bulletin is sent free, on application to the Department of Agriculture, Washington, D. C.

THAT $5.00 POULTRY-BOOK WITH ITS $5.00 SECRET; SEE PAGE 733.

Since my notice the author has informed us that the book will be sold in the future for only $1.00. The remainder of the $5.00 may be paid in 90 days or the book returned. My impression is that most people will think $1.00 is *enough* for a 50-cent book. The author also claims that what is said about sprouting grains, in the poultry-books and agricultural papers, has appeared only *since* he made his "great discovery." But I shall have to remind him that in the first edition of Stoddard's "Egg Farm," *published about 35 years ago*, he especially emphasized sowing oats every few days around the houses on the egg-farm, letting the chickens scratch them out whenever the grains are sprouted enough to suit them.

THE EVAPORATION OF APPLES.

The above is the title of an exceedingly valuable farmers' bulletin, No. 291. This spring, apples are worth $1.50 to $2.00 a bushel, and are of poor quality at that, and yet thousands of bushels—and I do not know but I might say a million—of beautiful apples went to waste last year because the market in that particular locality was glutted. The handsomest Duchess I ever saw lay rotting on the ground in Northern Michigan because the price offered was not sufficient to warrant the farmer for gathering them up. Now, evaporated

apples are good and wholesome, and I believe they seldom fail to bring a satisfactory price. If somebody in all the apple localities would make it his business to gather them up and dry out just enough of the water, they can be saved from waste and kept in good condition. This bulletin of 38 pages, full of nice pictures, tells all about the whole business; and, like all other farmers' bulletins, the information is given by somebody who has no apparatus to sell and no ax to grind except to help the fruit-growers of our land. Just tell the Secretary of Agriculture, Washington, D. C., that you want this bulletin and you will get it.

THE SPENCER SEEDLESS APPLE — MORE ABOUT IT.

One of our subscribers has mailed us a half-tone print of the seedless apple, showing it is not only seedless but that it has no core nor any sign of one. He also writes that he has some apples in a jar of alcohol, cut in two, showing no core whatever. I forwarded this letter and circular to the *Rural New-Yorker*, and the editor explains the matter as follows:

Dear Mr. Root:—I have one of their jars containing samples of the apples here in the office. It appears that they take these apples and cut out about half an inch or more of the center—thus, of course, entirely removing whatever core there might be; then they put the two ends into alcohol, and then, of course, they don't show any particular core whatever. The same thing could be done with a Baldwin or Northern Spy by cutting out a portion of the center of the seeds, and thus show a practically coreless apple. This is the way, as I understand it, that these samples are prepared, and this scheme has been exposed a number of times already at fruit-growers' meetings. The whole thing is a great humbug, and it seems impossible to make it clear to the people how great a humbug it is.

New York, June 4. H. W. COLLINGWOOD, *Ed.*

There, friends, what do you think of a man or company that resorts to such methods to sell their apple-trees at $2.00 each?

PERNICIOUS BOOKS AND MAGAZINES.

We clip the following from the *Home Herald* for June 12:

There are more than seventy books, which, on the score of their contents, can not be carried in the United States mail. Tolstoi's "Kreutzer Sonata" and all of Zola's works are among them. An attempt is now being made by the W. C. T. U. to eliminate from the mails "books in which the hero, heroine, or any character presented as worthy of admiration is pictured as an habitual user of liquors and cigarettes without condemnation of such habits.

Now, if there is any thing I can do to help the W. C. T. U. in the above undertaking I am ready to act. Furthermore, I want to put in a plea to eliminate from the mails all magazines that uphold the use of cigarettes and the habitual use of liquors in their stories as something for boys and girls to aspire to — that is, giving place to stories that mention these things, as the W. C. T. U. expresses it, "without condemnation of such habits."

THE WRIGHT BROTHERS AND THEIR AIR-SHIPS.

All the information we have at present is contained in the following, which we clip from the *Woman's National Daily*. The statements may be true, or they may be only a newspaper item:

PARIS, June 5.—Wilbur Wright, the American inventor, who is visiting here, refuses to talk about his aeroplane. He says he is merely visiting Europe for pleasure. He will have an opportunity to see Santos Dumont's air-ship, No. 16, which is ready for its trials.

BERLIN, June 6.—The Wright Brothers, of America, are here making arrangements for the construction of a number of air-ships for the German government.

Since the two above extracts were put in type a subscriber sends us a newspaper clipping which is evidently taken from the Baltimore *News* of June 8:

WRIGHTS SELL AIR-SHIP.

(Paris Cable Dispatch in New York *Times*.)

BALTIMORE, June 8.—The Wright Brothers, whose negotiations for the sale of their airship to the German government were announced exclusively in the cables of the New York *Times*, left Paris to-day for Berlin to conclude arrangements for the construction of a number of air-ships. It is understood that they will be paid $10,000 for each machine constructed by them. While in Paris they purchased several light motors of 24 and 40 horsepower.

THE INDIAN RUNNER DUCKS ONCE MORE.

Just as we go to press, June 13, two of these ducks, two weeks old to-day, weigh twelve ounces each. Somewhere I read that this strain of ducks might, under favorable circumstances, double their weight in a single week Well, ours almost *trebled* their weight the first week after being hatched, and have exactly trebled it during the second week.

RADIUM STILL RADIATES.

Mr. Root:—How is your radium—still shooting stars? You have not mentioned it for a long time.

Fredericktown Mo., May 12. JAS. BACHLER.

Friend B., after receiving your card I took my specimen of radium into a darkened closet, and I found it still pouring forth its streams of shooting stars. It makes one think of the burning bush that Moses turned aside to see—burning but not consumed. I have been watching the scientific journals, but there does not seem to be much progress made in furnishing radium at a lower price or in utilizing it for any thing more than a scientific curiosity. But it is certainly one of the wonders of the age—a wonder that is outside of and beyond any thing heretofore discovered in this world of ours—a veritable perpetual motion that continues day after day, week after week, month after month, and year after year to pour forth energy and light without diminution and without being consumed. It was a calamity to the world and a calamity that we ought to be ashamed of, that the man who had so much to do with giving the world this wonderful thing, radium, should have been allowed to lose his life by a piece of ignorant stupidity. Prof. Curie was driven over and killed by an ignorant cartman. One of his friends who knew him best said he feared some such calamity would occur, because he often became so absorbed in his scientific meditations that he was oblivious to every thing going on around him. This sad event may have had something to do with the fact that we have no recent developments in regard to radium and radio-activity.

SUDDEN DEATH OF AN IMPORTANT MEMBER OF OUR OFFICE FORCE.

Just now our factory, especially the office part of it, has been made very sad by the sudden and unexpected death of Mrs. H. B. Harrington, Mrs. Root's only sister. The older readers of GLEANINGS are more or less familiar with the name of "Neighbor H.," the man who married the deceased about 35 years ago.

For more than 25 years this youngest sister of Mrs. Root has been more or less intimately connected with the Home of the Honey-bees and this journal. When our business assumed such proportions that I could no longer open our letters, we began to look about for a trusty and faithful clerk to fill that important office. In our business, as in almost any other, disputes occasionally come up as to the contents of a letter. This happened oftener years ago than just now. Occasionally in settling difficulties of this kind a customer will say, "Mr. Root, if you opened all the letters yourself I should be perfectly certain that there was no fault at your end of the line," etc. But when I replied to all such complaints that the mails were all opened by Mrs. Root's *own sister*, I believe all such patrons were satisfied; and certainly any one who knew her, even for a little while, would be satisfied that no one would suffer from carelessness on her part or any thing else. She opened the mails as usual on June 3d; but on the 10th, with friends all about her, she ceased breathing as quietly as a babe going to sleep.

Her name was Mary; but her particular friends had shortened it to "Mate;" and the children very soon made it "Aunt Mate;" and for years past, just the *name* "Aunt Mate" has suggested something bright, cheery, hopeful, and animating. May God bless her memory; and, in fact, he has already abundantly blessed the good, pure, upright life she led. Even though she has been taken away so suddenly, the memory of that good life remains. "Their works do follow them."

"KIND WORDS."

It has been for a good many years our custom to publish every now and then some kind words in regard to GLEANINGS from our old friends. Now, to be fair to our readers I suppose we should in like manner publish criticisms when they come, although, to confess the truth, they do not come very often. Here is one from a brother who evidently objects to the space occupied by the Home Papers, and he certainly is entitled to a hearing like the others.

Gentlemen:—Some time ago I sent you $1.00 for GLEANINGS IN BEE CULTURE, thinking of course that it was a bee-paper, not the report of some Methodist prayer-meeting. Any further than that I will not be responsible. Discontinue it or it will be left at the postoffice. J. C. JORGENSEN.

Grand Haven, Mich., May 28.

PHOTOGRAPHIC - COMPETITION

We are pleased to announce another series of prizes for the best photographs submitted to us, as described below, in two series, American and foreign, under the following conditions:

FIRST.—The competition opens January 15th and closes October 1st, 1907. All photographs intended for this competition must be in our hands by the last-named date.

SECOND.—Competition for these prizes is limited to bee-keepers or some member of the family. Entries may be made for as many different classes as may be desired.

THIRD.—A photograph entered in one class can not be entered in any other class.

FOURTH.—Each photograph should be marked on the back with the name and full address of the sender, and the class in which it is entered. This is important.

FIFTH.—In judging the photographs, the general appearance, neatness, etc., of the apiary or exhibit or yard will be taken into consideration. Photos may be sent unmounted. We rather prefer them this way, and in a solio or reddish-brown tone if possible. However, send such as you can get most easily.

SIXTH.—With each of the photographs submitted we would like a brief statement of the conditions under which the apiary was photographed or honey produced, or similar information regarding the photograph. This should be limited to about one hundred words.

SEVENTH.—All photographs and correspondence regarding the same should be addressed to Advertising Department, GLEANINGS IN BEE CULTURE, Medina, Ohio.

EIGHTH.—We reserve the right to limit the number of awards or make no awards in any class if there are no suitable entries for that class.

AMERICAN COMPETITION — Including Canada and Mexico.

The following are the classes in which entries may be made:

CLASS A.—Photographs of any apiary in village, town, or city.

CLASS B.—View of an apiary not exceeding six hives in town or city.

CLASS C.—Apiary in town or country of not less than six hives or more than fifty hives.

CLASS D.—Apiary in town or country of fifty hives or more.

CLASS E.—Photograph of comb honey produced by a single colony of bees; not less than ten sections, and this preferably in plain sections.

CLASS F.—Photograph of a bee-keeper's home showing some view of the apiary if possible. The apiary need not be prominent in the picture, however.

CLASS G.—Photographs of a crop of honey from any number of colonies, six or more.

CLASS H.—Photographs of any apiarian exhibit of bees, supplies, or honey taken at fairs or shows of any kind.

CLASS I.—Photographs of any work in the bee-yard, such as hiving swarms, extracting, or any other operations with the hive.

CLASS J.—Photographs of any other subject relating to bee-keeping not classified above.

FOREIGN COMPETITION — same as the American.

PRIZES

	Value, Postpaid
FIRST.—One leather-bound "A B C of Bee Culture," 1907 English edition, or cloth-bound French or German..	$2.00
SECOND.—One half-leather "A B C of Bee Culture," 1907 English edition..	1.75
THIRD.—One "How to Keep Bees" and any two Swarthmore books.....	1.50
FOURTH.—One full cloth-bound "A B C of Bee Culture," 1907 English edition	1.20
FIFTH.—One "How to Keep Bees," by Anna Botsford Comstock.....	1.10
SIXTH.—One No. 1 bee-veil, all silk...	.80
SEVENTH.—One No. 2 bee-veil, silk face	.50
EIGHTH.—One illustrated book, "Bee Culture in Foreign Countries".....	.50
NINTH.—One Bee Model Queen (see Special Notices)	.50
TENTH.—One Bee Model Drone (see Special Notices)	.50

Ten prizes are offered for each class: Ten for Class A, Class B, Class C, etc.—one hundred prizes for each contest, American and Foreign, two hundred in all if that number of entries are received, the prizes offered being identical for each class for the American competition and for the Foreign.

If the winner of any certain prize has already the prize offered, we will, on request from him, furnish a selection of other items from our catalogs, of equal value.

ADDRESS ALL CORRESPONDENCE TO
Advertising Department, Gleanings in Bee Culture
The A. I. Root Company, Medina, Ohio, U.S.A.